



Service Manual



# Service Manual

## GD510



Model : GD510

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## **REVISED HISTORY**

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<b>Editor</b>	<b>Date</b>	<b>Issue</b>	<b>Contents of Changes</b>	<b>S/W Version</b>
		A		

\* The information in this manual is subject to change without notice and should not be construed as a commitment by LGE Inc. Furthermore, LGE Inc. reserves the right, without notice, to make changes to equipment design as advances in engineering and manufacturing methods warrant.

- This manual provides the information necessary to install, program, operate and maintain the GD510.

# 1. INTRODUCTION

## 1.1. Purpose

This manual provides the information necessary to repair, calibration, description and download the features of the GD510.

## 1.2. Regulatory Information

### 1.2.1. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges you're your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. LGE does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it. LGE will not be responsible for any charges that result from such unauthorized use.

### 1.2.2. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

### 1.2.3. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the GD510 or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

### 1.2.4. Maintenance Limitations

Maintenance limitations on the GD510 must be performed only at the LGE or its authorized agents. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alterations or repair may affect the regulatory status of the system and may void any remaining warranty.

### 1.2.5. Notice of Radiated Emissions

The GD510 complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

## **1. INTRODUCTION**

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### **1.2.6. Pictures**

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

### **1.2.7. Interference and Attenuation**

A GD510 may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

### **1.2.8. Electrostatic Sensitive Devices**

#### **ATTENTION**

A board, which contains Electrostatic Sensitive Device (ESD), are indicated by the sign. Following information is ESD handling: Service personnel should ground themselves by using a wrist strap when exchange system boards.

When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded. Use a suitable, grounded soldering iron. Keep sensitive parts in these protective packages until these are used. When returning system boards or parts such as EEPROM to the factory, use the protective package as described.

### 1.3 Abbreviation

For the purposes of this manual, following abbreviations apply:

◆ <b>APC</b>	Automatic Power Control
◆ <b>BB</b>	Baseband
◆ <b>BER</b>	Bit Error Ratio
◆ <b>CC-CV</b>	Constant Current – Constant Voltage
◆ <b>CLA</b>	Cigar Lighter Adapter
◆ <b>DAC</b>	Digital to Analog Converter
◆ <b>DCS</b>	Digital Communication System
◆ <b>dBm</b>	dB relative to 1 milli-watt
◆ <b>DSP</b>	Digital Signal Processing
◆ <b>EEPROM</b>	Electrical Erasable Programmable Read-Only Memory
◆ <b>EGPRS</b>	Enhanced General Packet Radio Service
◆ <b>EL</b>	Electroluminescence
◆ <b>ESD</b>	Electrostatic Discharge
◆ <b>FPCB</b>	Flexible Printed Circuit Board
◆ <b>GMSK</b>	Gaussian Minimum Shift Keying
◆ <b>GPIB</b>	General Purpose Interface Bus
◆ <b>GPRS</b>	General Packet Radio Service
◆ <b>GSM</b>	Global System for Mobile Communications
◆ <b>IPUI</b>	International Portable User Identity
◆ <b>IF</b>	Intermediate Frequency
◆ <b>LCD</b>	Liquid Crystal Display
◆ <b>LDO</b>	Low Drop Output
◆ <b>LED</b>	Light Emitting Diode
◆ <b>LGE</b>	LG Electronics
◆ <b>OPLL</b>	Offset Phase Locked Loop
◆ <b>PAM</b>	Power Amplifier Module
◆ <b>PCB</b>	Printed Circuit Board
◆ <b>PGA</b>	Programmable Gain Amplifier
◆ <b>PLL</b>	Phase Locked Loop
◆ <b>PSTN</b>	Public Switched Telephone Network
◆ <b>RF</b>	Radio Frequency
◆ <b>RLR</b>	Receiving Loudness Rating
◆ <b>RMS</b>	Root Mean Square
◆ <b>RTC</b>	Real Time Clock
◆ <b>SAW</b>	Surface Acoustic Wave
◆ <b>SIM</b>	Subscriber Identity Module
◆ <b>SLR</b>	Sending Loudness Rating

## 1. INTRODUCTION

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◆ <b>SRAM</b>	Static Random Access Memory
◆ <b>STMR</b>	Side Tone Masking Rating
◆ <b>TA</b>	Travel Adapter
◆ <b>TDD</b>	Time Division Duplex
◆ <b>TDMA</b>	Time Division Multiple Access
◆ <b>UART</b>	Universal Asynchronous Receiver/Transmitter
◆ <b>VCO</b>	Voltage Controlled Oscillator
◆ <b>DCXO</b>	Digitally Controlled Crystal Oscillator
◆ <b>WAP</b>	Wireless Application Protocol
◆ <b>8PSK</b>	8 Phase Shift Keying

## 2. PERFORMANCE

### 2.1 H/W Feature

Item	Feature	Comment
Standard Battery	Li-ion, 900mAh	
AVG TCVR Current	270mA typ	@PL5
Standby Current	2.3 mA typ	@PP9
Talk time	3 hours (GSM TX Level 7)	
Standby time	Over 250 hours (Paging Period:9, RSSI: -85dBm)	
Charging time	Under 3 hours	
RX Sensitivity	EGSM/GSM850:-105dBm↓ ,DCS/PCS:-105dBm↓	
TX output power	EGSM/GSM850 : 33dBm (@PL 5) DCS/PCS: 30dBm (@PL 0)	
GPRS compatibility	Class 10	
SIM card type	3V Small	
Display	Main 240 × 400 pixels, 3" WQVGA, 262K color	
Status Indicator	Send Key, Shortcut Key, Volume Up/Down Key, PWR Key, Camera Key, Lock Key	
ANT	Built in antenna	
EAR Phone Jack	u USB multi port Headset jack	
PC Synchronization	Yes	
Speech coding	HR/EFR/FR/AMR	
Data and Fax	Yes	
Vibrator	Yes	
Buzzer	No	
Voice Recoding	Yes	
C-Mic	Yes	
Receiver	Yes	
Travel Adapter	Yes	
Options	Bluetooth hands-free kit, Data Kit	

## 2. PERFORMANCE

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### 2.2 Technical specification

Item	Description	Specification																																																																																																																	
1	Frequency Band	GSM900 TX: $890 + 0.2 \times n$ MHz RX: $935 + 0.2 \times n$ MHz ( $n = 1 \sim 124$ ) EGSM TX: $890 + 0.2 \times (n-1024)$ MHz RX: $935 + 0.2 \times (n-1024)$ MHz ( $n = 975 \sim 1023$ ) DCS1800 TX: $1710 + (n-511) \times 0.2$ MHz ( $n = 512 \sim 885$ ) RX: TX + 95 MHz PCS1900 TX: $1850.2 + (n-512) \times 0.2$ MHz ( $n = 512 \sim 810$ ) RX: TX + 80MHz																																																																																																																	
2	Phase Error	RMS < 5 degrees Peak < 20 degrees																																																																																																																	
3	Frequency Error	< 0.1ppm																																																																																																																	
4	Power Level	GSM900/EGSM <table border="1"> <thead> <tr> <th>Level</th> <th>Power</th> <th>Toler.</th> <th>Level</th> <th>Power</th> <th>Toler.</th> </tr> </thead> <tbody> <tr><td>5</td><td>33 dBm</td><td>±2dB</td><td>13</td><td>17 dBm</td><td>±3dB</td></tr> <tr><td>6</td><td>31 dBm</td><td>±3dB</td><td>14</td><td>15 dBm</td><td>±3dB</td></tr> <tr><td>7</td><td>29 dBm</td><td>±3dB</td><td>15</td><td>13 dBm</td><td>±3dB</td></tr> <tr><td>8</td><td>27 dBm</td><td>±3dB</td><td>16</td><td>11 dBm</td><td>±5dB</td></tr> <tr><td>9</td><td>25 dBm</td><td>±3dB</td><td>17</td><td>9 dBm</td><td>±5dB</td></tr> <tr><td>10</td><td>23 dBm</td><td>±3dB</td><td>18</td><td>7 dBm</td><td>±5dB</td></tr> <tr><td>11</td><td>21 dBm</td><td>±3dB</td><td>19</td><td>5 dBm</td><td>±5dB</td></tr> <tr><td>12</td><td>19 dBm</td><td>±3dB</td><td></td><td></td><td></td></tr> </tbody> </table> DCS1800/PCS1900 <table border="1"> <thead> <tr> <th>Level</th> <th>Power</th> <th>Toler.</th> <th>Level</th> <th>Power</th> <th>Toler.</th> </tr> </thead> <tbody> <tr><td>0</td><td>30 dBm</td><td>±2dB</td><td>8</td><td>14 dBm</td><td>±3dB</td></tr> <tr><td>1</td><td>28 dBm</td><td>±3dB</td><td>9</td><td>12 dBm</td><td>±4dB</td></tr> <tr><td>2</td><td>26 dBm</td><td>±3dB</td><td>10</td><td>10 dBm</td><td>±4dB</td></tr> <tr><td>3</td><td>24 dBm</td><td>±3dB</td><td>11</td><td>8 dBm</td><td>±4dB</td></tr> <tr><td>4</td><td>22 dBm</td><td>±3dB</td><td>12</td><td>6 dBm</td><td>±4dB</td></tr> <tr><td>5</td><td>20 dBm</td><td>±3dB</td><td>13</td><td>4 dBm</td><td>±4dB</td></tr> <tr><td>6</td><td>18 dBm</td><td>±3dB</td><td>14</td><td>2 dBm</td><td>±5dB</td></tr> <tr><td>7</td><td>16 dBm</td><td>±3dB</td><td>15</td><td>0 dBm</td><td>±5dB</td></tr> </tbody> </table>						Level	Power	Toler.	Level	Power	Toler.	5	33 dBm	±2dB	13	17 dBm	±3dB	6	31 dBm	±3dB	14	15 dBm	±3dB	7	29 dBm	±3dB	15	13 dBm	±3dB	8	27 dBm	±3dB	16	11 dBm	±5dB	9	25 dBm	±3dB	17	9 dBm	±5dB	10	23 dBm	±3dB	18	7 dBm	±5dB	11	21 dBm	±3dB	19	5 dBm	±5dB	12	19 dBm	±3dB				Level	Power	Toler.	Level	Power	Toler.	0	30 dBm	±2dB	8	14 dBm	±3dB	1	28 dBm	±3dB	9	12 dBm	±4dB	2	26 dBm	±3dB	10	10 dBm	±4dB	3	24 dBm	±3dB	11	8 dBm	±4dB	4	22 dBm	±3dB	12	6 dBm	±4dB	5	20 dBm	±3dB	13	4 dBm	±4dB	6	18 dBm	±3dB	14	2 dBm	±5dB	7	16 dBm	±3dB	15	0 dBm	±5dB
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## 2. PERFORMANCE

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		GSM900/EGSM
		Offset from Carrier (kHz). Max. dBc
		100 +0.5
		200 -30
		250 -33
		400 -60
		600 ~ 1,200 -60
		1,200 ~ 1,800 -60
		1,800 ~ 3,000 -63
		3,000 ~ 6,000 -65
		6,000 -71
		DCS1800/PCS1900
		Offset from Carrier (kHz). Max. dBc
		100 +0.5
		200 -30
		250 -33
		400 -60
		600 ~ 1,200 -60
		1,200 ~ 1,800 -60
		1,800 ~ 3,000 -65
		3,000 ~ 6,000 -65
		6,000 -73
		GSM900/EGSM
		Offset from Carrier (kHz) Max. (dBm)
		400 -19
		600 -21
		1,200 -21
		1,800 -24
		DCS1800/PCS1900
		Offset from Carrier (kHz) Max. (dBm)
		400 -22
		600 -24
		1,200 -24
		1,800 -27

## 2. PERFORMANCE

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7	Spurious Emissions	Conduction, Emission Status Conduction, Emission Status		
8	Bit Error Ratio	EGSM BER (Class II) < 2.439% @ -102dBm DCS1800/PCS1900 BER (Class II) < 2.439% @ -100dBm		
9	Rx Level Report accuracy	$\pm 3$ dB		
10	SLR	$8 \pm 3$ dB		
11	Sending Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	/
		200	0	/
		300	0	-12
		1,000	0	-6
		2,000	4	-6
		3,000	4	-6
		3,400	4	-9
		4,000	0	/
12	RLR	$2 \pm 3$ dB		
13	Receiving Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	/
		200	0	/
		300	2	-7
		500	*	-5
		1,000	0	-5
		3,000	2	-5
		3,400	2	-10
		4,000	2	
* Mean that Adopt a straight line in between 300 Hz and 1,000 Hz to be Max. level in the range.				
14	STMR	$13 \pm 5$ dB		
15	Stability Margin	> 6 dB		
16	Distortion	dB to ARL (dB)		Level Ratio (dB)
		-35		17.5
		-30		22.5
		-20		30.7
		-10		33.3
		0		33.7
		7		31.7
		10		25.5

## 2. PERFORMANCE

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17	Side tone Distortion	Three stage distortion < 10%	
18	<Change> System frequency (26 MHz) tolerance	≤ 2.5 ppm	
19	<Change>32.768KHz tolerance	≤ 30ppm	
20	Power consumption	Standby - Normal, ≤ 3 mA(@PP9)	
21	Talk Time	EGSM/LvI 7 (Battery Capacity 800mA):180 min EGSM/Lvl12(Battery Capacity 800 mA):320min	
22	Standby Time	Under conditions, at least 300 hours: 1. Brand new and full 800mAh battery 2. Full charge, no receive/send and keep GSM in idle mode. 3. Broadcast set off. 4. Signal strength display set at 3 level above. 5. Backlight of phone set off.	
23	Ringer Volume	At least 65 dB under below conditions: 1. Ringer set as ringer. 2. Test distance set as 50 cm	
24	Charge Current	Fast Charge : < 400 mA Slow Charge: < 120 mA	
25	Antenna Display	Antenna Bar Number	Power
		7	>-92 dBm ~
		5	-97dBm ~ -93dBm
		4	-100dBm ~ -98dBm
		2	-103dBm ~ -101dBm
		1	-105dBm ~ -104dBm
		0	< -106 dBm
26	Battery Indicator	Off	No Service
		Battery Bar Number	Voltage ( $\pm 0.05V$ )
		3	3.69V~4.2V
		2	3.53V~3.69V
		1	3.43V~3.53V
		0	3.35V~3.43V
27	Low Voltage Warning	3.53V $\downarrow \pm 0.05V$ (Call)	
		3.43V $\downarrow \pm 0.05V$ (Standby)	
28	Forced shut down Voltage	3.3 ± 0.05 V	

## 2. PERFORMANCE

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29	Battery Type	Li-ion Battery Standard Voltage = 3.7 V Battery full charge voltage = 4.2 V Capacity: 900mAh
30	Travel Charger	Switching-mode charger Input: 150 ~ 240 V, 50/60Hz Out put: 5.6, 0.7A

## 2. PERFORMANCE

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\* EDGE RF Specification (Option: is not serviced for "EDGE mode")]

Item	Description	Specification					
1	RMS EVM						≤9%
2	Peak EVM						≤30%
3	95 <sup>th</sup> Percentile EVM						≤15%
4	Origin Offset Suppression						≥30dB
5	Power Level	<b>GSM900/EGSM</b>					
		Level	Power	Toler.	Level	Power	Toler.
		5	27dBm	±3dB	13	17dBm	±3dB
		6	27dBm	±3dB	14	15dBm	±3dB
		7	27dBm	±3dB	15	13dBm	±3dB
		8	27dBm	±3dB	16	11dBm	±5dB
		9	25dBm	±3dB	17	9dBm	±5dB
		10	23dBm	±3dB	18	7dBm	±5dB
		11	21dBm	±3dB	19	5dBm	±5dB
		12	19dBm	±3dB			
		<b>DCS1800, PCS1900</b>					
		Level	Power	Toler.	Level	Power	Toler.
6	Output RF Spectrum (due to modulation)	0	26/25dBm	±3dB	8	14dBm	±3dB
		1	26/25dBm	±3dB	9	12dBm	±4dB
		2	26/25dBm	±3dB	10	10dBm	±4dB
		3	24dBm	±3dB	11	8dBm	±4dB
		4	22dBm	±3dB	12	6dBm	±4dB
		5	20dBm	±3dB	13	4dBm	±4dB
		6	18dBm	±3dB	14	2dBm	±5dB
		7	16dBm	±3dB	15	0dBm	±5dB
		<b>GSM900/EGSM</b>					
		Offset from carrier(kHz)		Max. dBc			
		100					+0.5
6	Output RF Spectrum (due to modulation)	200					-30
		250					-33
		400					-54
		600~<1,200					-60
		1,200~<1,800					-60
		1,800~<3,000					-63
		3,000~<6,000					-65
		6,000					-71
		<b>DCS1800, PCS1900</b>					
		Offset from carrier(kHz)		Max. dBc			
		100					+0.5

## 2. PERFORMANCE

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7	Output RF Spectrum (due to switching transient)	<b>GSM900/EGSM</b>	
		Offset from carrier(kHz)	Max. dBm
		400	-23
		600	-26
		1,200	-27
		1,800	-30
		<b>DCS1800, PCS1900</b>	
		Offset from carrier(kHz)	Max. dBm
		400	-23
		600	-26
		1,200	-27
		1,800	-30

## 3. Technical brief

### 3-1. Baseband circuit

#### 3.1. GD510 Functional Block diagram.

The functional component arrangement is mentioned below diagram.

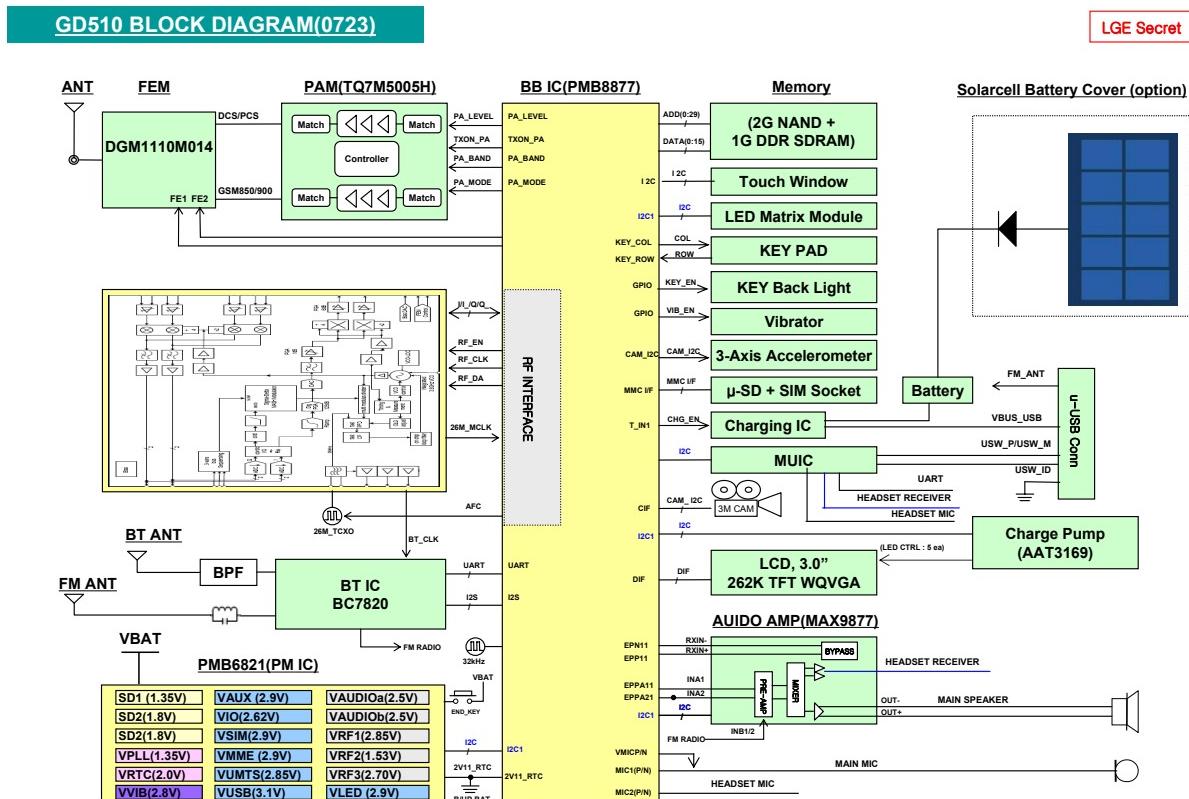


Figure 1 GD510 Functional block diagram

### 3. Technical brief

#### 3.2. Baseband Processor (BBP) Introduction

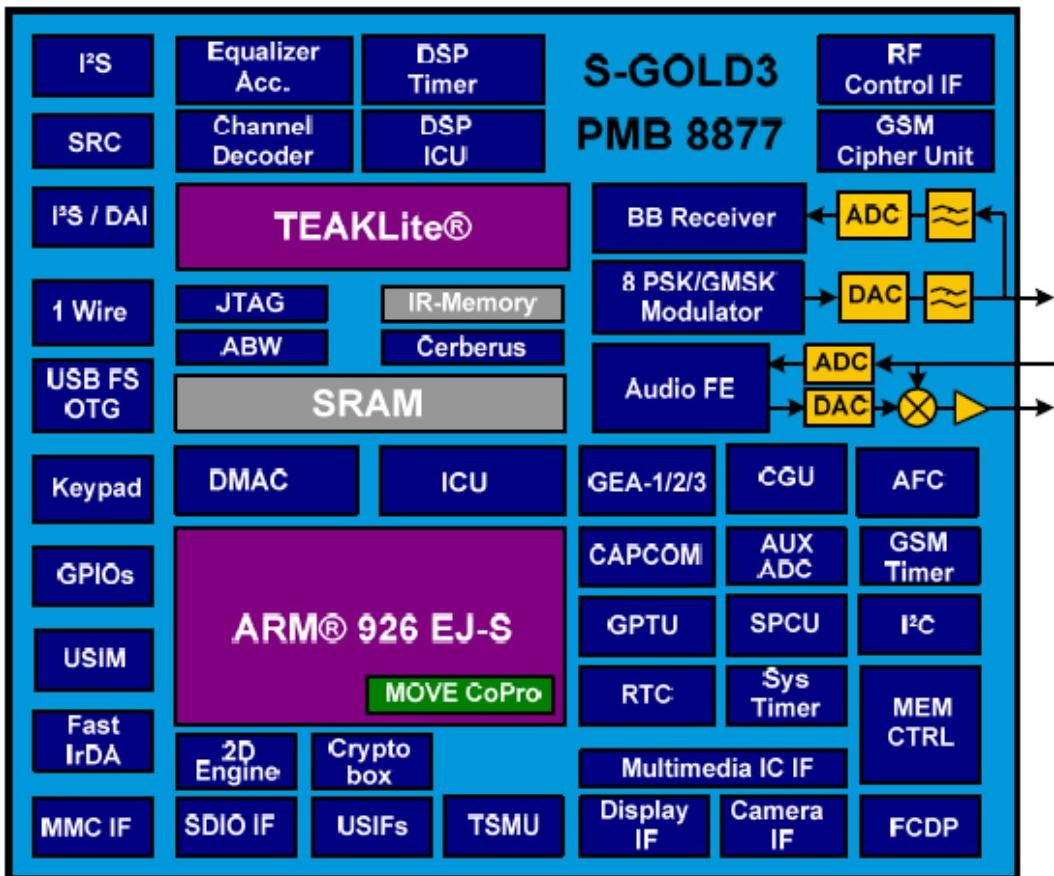


Figure 2 Top level block diagram of the S-GOLD3™ (PMB8877)

##### 3.2.1. General Description

S-GOLD3™ is a GSM/EDGE single chip mixed signal Baseband IC containing all analog and digital functionality of a cellular radio. Additionally S-GOLD3™ Provides multimedia extensions such as camera, software MIDI, MP3 sound. It is designed as a single chip solution, integrating the digital and mixed signal portions of the base band in 0.09um, 1.2V technology.

The chip will fully support the FR, EFR, HR and AMR-NB vocoding.

S-GOLD3™ support multi-slot operation modes HSCSD (up to class 10), GPRS for high speed data application (up to class 12) and EGPRS (up to class 12) without additional external hardware.

##### 3.2.2. Block Description

###### ● Processing core

ARM926EJ-S 32 bit processor core for controller functions. The ARM926EJ-S includes an MMU, and the Jazelle Java extension for Java acceleration.

- TEAKLite DSP core

#### ● ARM-Memory

- 32k Byte Boot ROM on the AHB
- 96k Byte SRAM on the AHB, flexibly usable as program or data RAM
- 16k Byte Cache for Program (internal)
- 8k Byte tightly coupled memory for Program(internal)
- 8k Byte Cache for Data(internal)
- 8k Byte tightly coupled memory for Data(internal)

#### ● DSP-Memory

- 104K x 16bit Program ROM
- 8k x 16bit Program RAM
- 60k x 16bit Data ROM
- 37k x 16bit Data RAM
- Incremental Redundancy(IR) Memory of 35904 words of 16bit

#### ● Shared Memory Block

1.5K x 32bit Shared RAM(dual ported) between controller system and TEAKLite.

#### ● Controller Bus system

The processor cores and their peripherals are connected by powerful buses.

Multi-layer AHB for connecting the ARM and the other master capable building blocks with the internal and external memories and with the peripheral buses.

#### ● Clock system

The clock system allows widely independent selection of frequencies for the essential parts of the S-GOLD3. Thus power consumption and performance can be optimized for each application.

#### ● Functional Hardware block

- CPU and DSP Timers
- MOVE coprocessor performing motion estimation for video encoding algorithms (H.263, MPEG-4)
- Programmable PLL with additional phase shifters for system clock generation
- GSM Timer Module that off-loads the CPU from radio channel timing
- GMSK / 8-PSK Modulator according to GSM-standard 05.04 (5/2000)
- GMSK Modulator: gauss-filter with  $B*T=0.3$
- EDGE Modulator: 8PSK-modulation with linearized GMSK-Pulse-Filter
- Hardware accelerators for equalizer and channel decoding.
- Incremental Redundancy memory for EDGE class 12 support
- A5/1, A5/2, A5/3 Cipher unit
- GEA1, GEA2, GEA3 Cipher Unit to support GPRS data transmission
- Advanced static and dynamic power management features including TDMA-Frame synchronous low power mode and enhanced CPU modes(idle and sleep modes)
- Pulse Number Modulation output for Automatic Frequency Correction(AFC)
- Serial RF Control interface: support of direct conversion RF
- A Universal Serial Interface(USIF) enabling asynchronous (UART) of synchronous (SPI) serial data transmission
- 3 USIF with autobaud detection, hardware flow control and integrated
- A dedicated Fas IrDA Controller supporting IrDA's SIR,MIR and FIR standards (up to 4Mbps)
- I2C-bus interface (e.g. connection to S/M power)
- A fast display interface supporting serial and parallel interconnection
- An ITU-R BT.656 compatible Camera interface.
- Programmable clock output for a camera
- An multimedia/Secure Digital Card Interface (MMCI/SD:SDIO capable)

### 3. Technical brief

#### 3.2.3. External Devices connected to memory interface

Table 1. Memory interface

Device	Name	Maker	Remark
FLASH	K522H1HACB-B060	Samsung	Synchronous / A synchronous
DDR	K522H1HACB-B060	Samsung	Synchronous 166MHz
LCD	IM200DST2A	LGIT	8bit access 2 times transmission
Melody IC	Not Used	S/W	Infineon Software CODEC

#### 3.2.4. RF Interface (T\_OUT)

S-Gold3 uses this interface to control RF IC and Peripherals. 13 signals are provided switch on/off RF ICs Periodically each TDMA frame.

Table 2. RF Interface Spec.

T_OUT		
Resource	Interconnection	Description
T_OUT0	TXON_PA	PAM Power on
T_OUT1	FE2	FEM control
T_OUT2	PA_BAND	TX RF band select
T_OUT3	FE1	FEM control
T_OUT4	Other function	-
T_OUT5	Other function	-
T_OUT6	PA MODE	PAM Mode select

#### 3.2.5. USIF Interface

GD510 have three USIF Drivers as follow :

- USIF1 : Hardware Flow Control / SW upgrade / Calibration
- USIF2 : Not used Rx, Tx and CTS, RTS use BT Interface
- USIF3 : BT Interface

Table 3. USIF Interface Spec.

Resource	Name	Remark
<b>USIF1</b>		
USIF1_TXD	UART_TX	Transmit Data
USIF1_RXD	UART_RX	Receive Data
USIF1_CTS	USB_DAT_VP	
USIF1_RTS	USB_SE0_VM	
<b>USIF2</b>		
USIF2_TXD	SOLBAT_CHG_EN	
USIF2_RXD	ACCEL_INT	
USIF2_CTS	UART_BT_CTS	
USIF2_RTS	UART_BT_RTS.	
<b>USIF3</b>		
USIF3_TXD	UART_BT_TX	BT Transmit tx
USIF3_RXD	UART_BT_RX	BT Receive rx

#### 3.2.6. ADC channel

BBP ADC block is composed of 10 external ADC channel. This block operates charging process and other related process by reading battery voltage and other analog values.

**Table 4. S-Gold3 ADC channel usage**

ADC channel		
Resource	Interconnection	Description
M0	BAT_ID	Battery temperature measure
M1	RF_TEMP	RF block temperature measure
M2	N.C	
M3	N.C	
M4	N.C	
M5	N.C	
M6	N.C	
M7	N.C	
M8	VSUPPLY	Battery supply voltage measure
M9	N.C	
M10	N.C	

#### 3.2.7. GPIO map

Over a hundred allowable resources, GD510 is using as follows except dedicated to SIM and Memory. GD510 GPIO(General Purpose Input/Output) Map, describing application, I/O state, and enable level, is shown in below table

**Table 5 S-Gold3 GPIO pin Map**

Port Function	Net Name	Description
<b>KEY MATRIX</b>		
KP_IN0		
KP_IN1		
KP_IN2		
KP_IN3	KP_IN(3)	
KP_IN4		
KP_IN5	KP_IN(5)	
KP_IN6	KP_IN(6)	
KP_OUT0	KP_OUT(0)	
KP_OUT1	LIN_INVERT	
KP_OUT2	KP_OUT(2)	
KP_OUT3	KP_OUT(3)	
<b>USIF1</b>		
USIF1_RXD	UART_RX	UART, RS232 Data
USIF1_TXD	UART_TX	UART, RS232 Data
USIF1_RTS_N	USB_DAT_VP	USB Data
USIF1_CTS_N	USB_SE0_VM	USB Data
<b>USIF2</b>		
USIF2_RXD	ACCEL_INT	
USIF2_TXD	SOLBAT_CHG_EN	Solar cell charge Enable

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<b>USIF2_RTS_N</b>	UART_BT_RTS	Bluetooth RTS
<b>USIF2_CTS_N</b>	UART_BT_CTS	Bluetooth CTS
<b>USIF3</b>		
<b>USIF3_RXD</b>	UART_BT_RX	Bluetooth RX
<b>USIF3_TXD</b>	UART_BT_TX	Bluetooth TX
<b>CLK</b>		
<b>CLK32K</b>	CLK32k	For FM Radio, BT CLK32K
<b>GPIO_22</b>		Not used
<b>CAMERA I/F</b>		
<b>CIF_D0</b>	CIF_D(0)	Camera DATA[0]
<b>CIF_D1</b>	CIF_D(1)	Camera DATA[1]
<b>CIF_D2</b>	CIF_D(2)	Camera DATA[2]
<b>CIF_D3</b>	CIF_D(3)	Camera DATA[3]
<b>CIF_D4</b>	CIF_D(4)	Camera DATA[4]
<b>CIF_D5</b>	CIF_D(5)	Camera DATA[5]
<b>CIF_D6</b>	CIF_D(6)	Camera DATA[6]
<b>CIF_D7</b>	CIF_D(7)	Camera DATA[7]
<b>CIF_PCLK</b>	CIF_PCLK	Camera pixel clock
<b>CIF_HSYNC</b>	CIF_HS	Camera H sync
<b>CIF_VSYNC</b>	CIF_VS	Camera V sync
<b>CLKOUT</b>	CIF_MCLK	Camera main clock
<b>CIF_PD</b>	CIF_PD	Camera power down(active high)
<b>CIF_RESET</b>	CIF_RESET	Camera reset
<b>LCD I/F</b>		
<b>DIF_D0</b>	DIF_D(0)	DIF_D0
<b>DIF_D1</b>	DIF_D(1)	DIF_D1
<b>DIF_D2</b>	DIF_D(2)	DIF_D2
<b>DIF_D3</b>	DIF_D(3)	DIF_D3
<b>DIF_D4</b>	DIF_D(4)	DIF_D4
<b>DIF_D5</b>	DIF_D(5)	DIF_D5
<b>DIF_D6</b>	DIF_D(6)	DIF_D6
<b>DIF_D7</b>	DIF_D(7)	DIF_D7
<b>DIF_D8</b>	DIF_D(8)	LCD data[8]
<b>DIF_CS1</b>	DIF_MAIN_CS	MAIN LCD chip select
<b>DIF_CS2</b>		Not used
<b>DIF_CD</b>	DIF_CD	Command Data switch
<b>DIF_WR</b>	DIF_WR	LCD Write
<b>DIF_HD</b>	SOLBAT_DETECT	Solar cell Detect
<b>DIF_RESET1</b>	_DIF_RESET	LCD Reset
<b>MMCI2_CLK</b>	VIB_EN	Vibrator enable
<b>I2C</b>		
<b>I2C_SCL</b>	I2C_SCL	For FM/BT/Amp/Camera
<b>I2C_SDA</b>	I2C_SDA	For FM/BT/Amp/Camera
<b>PM_INT (EINT)</b>	PM_INT	
<b>SIM I/F</b>		
<b>CC_IO</b>	SIM_IO	SIM CARD I/O
<b>CC_CLK</b>	SIM_CLK	SIM CARD CLOCK

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<b>CC_RST</b>	SIM_RST	SIM CARD RESET
<b>I2S2</b>		
<b>I2S2_CLK0</b>	CHG_EOC	Charge done indicator
<b>GPIO_102</b>	LCD_ID	
<b>I2S2_RX</b>	_PPR	OVP threshold of charging IC
<b>I2S2_TX</b>		Not used
<b>I2S2_WA0</b>	KEY_EN	Key Backlight LED Enable
<b>I2S2_WA1</b>	KEY_BL_BLUE	Key Backlight BLUE LED Enable
<b>External Memory</b>		
<b>MMC1_CMD</b>	MMC_CMD	T-flash
<b>MMC1_DAT[0]</b>	MMC_DAT0	T-flash
<b>MMC1_CLK</b>	MMC_CLK	T-flash
<b>GPIO_109</b>	CAM_LDO_EN	3M Camera LDO Enable
<b>IrDA</b>		
<b>IRDA_TX</b>	USB_OEN	
<b>IRDA_INT</b>	BT_INT	
<b>I2S1</b>		
<b>I2S1_CLK0</b>	I2S1_CLK	For Bluetooth
<b>GPTU0_0</b>		Not Used
<b>I2S1_RX</b>	I2S1_RX	For Bluetooth
<b>I2S1_TX</b>	I2S1_TX	For Bluetooth
<b>I2S1_WA0</b>	I2S1_WA	For Bluetooth
<b>External Memory</b>		
<b>MMCI_DAT[1]</b>	MMC_DAT[1]	T-flash
<b>MMCI_DAT[2]</b>	MMC_DAT[2]	T-flash
<b>MMCI_DAT[3]</b>	MMC_DAT[3]	T-flash
<b>Audio I/F</b>		
<b>EPN11</b>	EAR_N	For Headset
<b>EPP11</b>	EAR_P	For Headset
<b>EPPA1</b>	BBP_SND_L	For Speaker
<b>EPREF</b>		Reference
<b>EPPA2</b>	BBP_SND_R	For Speaker
<b>MICN1</b>	MAIN_MIC_N	For Mic
<b>MICP1</b>	MAIN_MIC_P	For Mic
<b>MICN2</b>	HS_MIC_N	For Headset Mic
<b>MICP2</b>	HS_MIC_P	For Headset Mic
<b>VMICP</b>	VMIC_P	Power for MIC
<b>VMICN</b>	VMIC_N	Power for MIC
<b>ADC</b>		
<b>M0</b>	BAT_ID	Battery temperature measure
<b>M1</b>	RF_TEMP	RF block temperature measure
<b>M2</b>		
<b>M3</b>		
<b>M7</b>		
<b>M8</b>	VSUPPLY	Battery supply voltage measure

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<b>M9</b>		
<b>M10</b>		
<b>Reference</b>		
<b>VREF</b>		
<b>IREF</b>		
<b>JTAG I/F</b>		
<b>TDO</b>	TDO	JTAG
<b>TDI</b>	TDI	JTAG
<b>TMS</b>	TMS	JTAG
<b>TCK</b>	TCK	JTAG
<b>TRST_n</b>	TRST	JTAG
<b>RTCK</b>	RTCK	JTAG
<b>ETM I/F</b>		
<b>TRIG_IN</b>	TRIG_IN	ETM (Embedded Trace Macro Cell)
<b>MON1</b>	MON1	ETM
<b>MON2</b>	MON2	ETM
<b>TRACESYNC</b>	TRACESYNC	ETM
<b>TRACECLK</b>	TRACECLK	ETM
<b>PIPESTAT[2]</b>	PIPESTAT2	ETM
<b>PIPESTAT[1]</b>	PIPESTAT1	ETM
<b>PIPESTAT[0]</b>	PIPESTAT0	ETM
<b>TRACEPKT[0]</b>	TRACEPKT(0)	ETM
<b>TRACEPKT[1]</b>	TRACEPKT(1)	ETM
<b>TRACEPKT[2]</b>	TRACEPKT(2)	ETM
<b>TRACEPKT[3]</b>	TRACEPKT(3)	ETM
<b>TRACEPKT[4]</b>	TRACEPKT(4)	ETM
<b>TRACEPKT[5]</b>	TRACEPKT(5)	ETM
<b>TRACEPKT[6]</b>	TRACEPKT(6)	ETM
<b>TRACEPKT[7]</b>	TRACEPKT(7)	ETM
<b>Memory</b>		
<b>MEM_AD[0]</b>	DATA(0)	
<b>MEM_AD[1]</b>	DATA (1)	
<b>MEM_AD[2]</b>	DATA (2)	
<b>MEM_AD[3]</b>	DATA D(3)	
<b>MEM_AD[4]</b>	DATA (4)	
<b>MEM_AD[5]</b>	DATA (5)	
<b>MEM_AD[6]</b>	DATA (6)	
<b>MEM_AD[7]</b>	DATA (7)	
<b>MEM_AD[8]</b>	DATA (8)	
<b>MEM_AD[9]</b>	DATA (9)	
<b>MEM_AD[10]</b>	DATA (10)	
<b>MEM_AD[11]</b>	DATA (11)	
<b>MEM_AD[12]</b>	DATA (12)	
<b>MEM_AD[13]</b>	DATA (13)	
<b>MEM_AD[14]</b>	DATA (14)	
<b>MEM_AD[15]</b>	DATA (15)	
<b>MEM_WR_n</b>	_WR	

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<b>MEM_RD_n</b>	_RD	
<b>MEM_BC0_n</b>	_BC0	
<b>MEM_BC1_n</b>	_BC1	
<b>MEM_A[0]</b>	ADD(0)	
<b>MEM_A[1]</b>	ADD (1)	
<b>MEM_A[2]</b>	ADD (2)	
<b>MEM_A[3]</b>	ADD (3)	
<b>MEM_A[4]</b>	ADD (4)	
<b>MEM_A[5]</b>	ADD (5)	
<b>MEM_A[6]</b>	ADD (6)	
<b>MEM_A[7]</b>	ADD (7)	
<b>MEM_A[8]</b>	ADD (8)	
<b>MEM_A[9]</b>	ADD (9)	
<b>MEM_A[10]</b>	ADD (10)	
<b>MEM_A[11]</b>	ADD (11)	
<b>MEM_A[12]</b>	ADD (12)	
<b>MEM_A[13]</b>	ADD (13)	
<b>MEM_A[14]</b>	ADD (14)	
<b>MEM_A[15]</b>	ADD (15)	
<b>MEM_A[16]</b>	ADD (16)	
<b>MEM_A[17]</b>	ADD (17)	
<b>MEM_A[18]</b>	ADD (18)	
<b>MEM_A[19]</b>	ADD (19)	
<b>MEM_A[20]</b>	ADD (20)	
<b>MEM_A[21]</b>	ADD (21)	
<b>MEM_A[22]</b>	ADD (22)	
<b>MEM_A[23]</b>	ADD (23)	
<b>MEM_A[24]</b>	ADD (24)	
<b>MEM_CS0_n</b>	_NAND_CS	Samsung Nand (2GB)
<b>MEM_CS1_n</b>	_RAM_CS	Samsung SDRAM (1GB)
<b>MEM_CS2_n</b>		
<b>MEM_CS3_n</b>		
<b>MEM_ADV_n</b>		
<b>MEM_RAS_n</b>	_RAS	
<b>MEM_CAS_n</b>	_CAS	
<b>MEM_WAIT_n</b>	_WAIT	
<b>MEM_SDCLKO</b>	SDCLKO	For Burst mode
<b>MEM_SDCLKI</b>	SDCLKI	For Burst mode
<b>MEM_BFCLKO</b>	BFCLKO	For Burst mode
<b>MEM_BFCLKI</b>	BFCLKI	For Burst mode
<b>MEM_CKE</b>	CKE	
<b>Memory</b>		
<b>FCDP_RBn</b>	FCDP	
<b>TDMA I/F</b>		
<b>T_OUT0</b>	TXON_PA	PAM
<b>T_OUT1</b>	FE2	PAM
<b>T_OUT2</b>	PA_BAND	PAM

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T_OUT3	FE1	PAM
T_OUT4		
T_OUT5	LIN_PWM_MAG	
T_OUT6	PA_MODE	PAM
T_OUT7	LIN_PWM_FRQ	
T_OUT8	DSR	
T_OUT9	LCD_BACKLIGHT	LCD Backlight control
GPIO_53	USW_INT	Interrupt Output of MUIC
GPIO_54	BT_LDO_EN	Bluetooth LDO Enable
<b>RF I/F</b>		
RF_STR0	RF_EN	
RF_STR1	V_BUS	Charging Detect
RF_DATA	RF_DA	
RF_CLK	RF_CLK	
<b>System Port</b>		
AFC		
CLKOUT0 [<=26MHz]		Not used
F26M	26MHZ_MCLK	26M Main Clock
F32K		to 32k crystal
OSC32K		to 32k crystal
RESET_n	_RESET	
TRIG_OUT	TRIG_OUT	
RTC_OUT	RTC_OUT	
VCXO_EN	VCXO_EN	
<b>DSP</b>		
DSPIN0	CLK32K	
DSPOUT1	WDOG	Watch Dog
DSPIN1		

## 3.3. Power management IC

### 3.3.1. General Description

SM-POWER is a highly integrated Power and Battery Management IC for mobile handsets. It has been specially designed for usage with S-Gold3. Although optimized for usage with the Infineon S-GOLD baseband device it is suitable for the S-GOLDlite and the E-GOLD+ baseband devices as well. It also supports the cellular RF devices like SMARTi-DC, SMARTi-DC+, SMARTi-SD and the Bluemoon Single, Infineon's single chip solution for Bluetooth. If used with S-GOLD3 it provides all power supply functions (except for the RF PA) for a complete advanced GSM Edge smart phone minimizing external device count.

#### Block Description

- Highly efficient step-down converter for main digital baseband supply including Core, DSP and memory interface (External Bus Unit).
- Support of S-GOLD standby power-down concept
- Low-drop-out (LDO) regulators for Flash and mobile RAM memory devices
- Voltage independent switching of two SIM cards
- LDO regulators for baseband I/O supply
- LDO regulator for analog mixed-signal section of S-GOLD
- Low-noise LDO regulators for RF devices
- Supply for Bluemoon Single, Infineon's single chip solution for Bluetooth
- Audio amplifier 8 Ohms for handsfree operation and ringing
- Charge Control for charging Li-Ion/Polymer batteries under software control
- Pre-charge current generator with selectable current level
- RTC regulator with ultra-low quiescent current
- USB interface support for peripheral and mini-host mode
- Backlight LEDs driver with current selection and PWM dimming function
- Two single LED driver outputs for signaling
- Vibrator driver with adjustable voltage
- Fully controllable by software via I2C – Bus
- Temperature and battery voltage sensors
- Interrupt channels for peripherals
- System debug mode
- VQFN 48 package with heat sink and non-protruding leads
- Compatible with the Infineon E-GOLD+ V2 and V3

SM-POWER is a further step on the successful E-Power product line with enhanced and optimized functionality.

SM-POWER features a baseband supply concept with a DC/DC step-down converter cascaded by two linear regulators

- SM-POWER's DC/DC converter makes up to 40 % reduction of battery current for smart phone functions (e.g. organizer functions, games, MP3 decoding) possible.
- SDBB has high efficiency up to 95% and also a power save mode.
- Memory Interface is directly supported by the SDBB
- SDBB can also act as main supply voltage for E-GOLD+ or S-GOLDlite baseband devices.  
For S-GOLD, two linear regulators for DSP and Core are cascaded after the SDBB.

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SM-POWER supports the standby power-down concept of S-GOLD by temporarily switching off the linear regulator for the DSP during mobile standby whenever this subsystem is not used. In this phase the ARM controller and most peripherals including parts of the on-chip SRAM are kept powered-up with power being supplied by the other linear regulator.

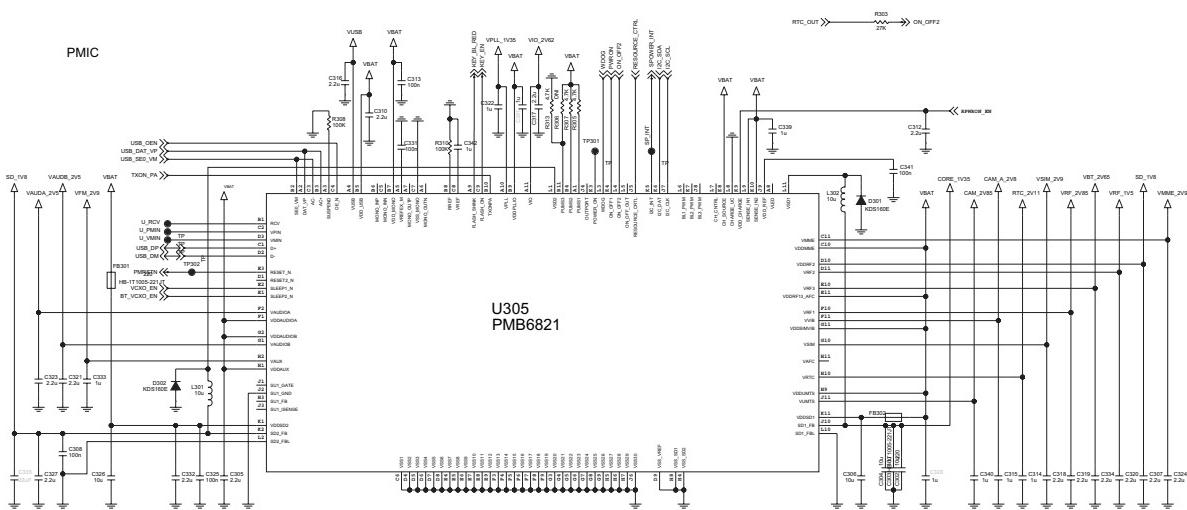
SM-POWER includes a fully differential audio amplifier able to drive loads down to a nominal value of 8 Ohm for usage in hands-free phones and for ringing

- 450 mW maximum output power
  - adjustable gain
  - mute switch SM-POWER also integrates a charging function for Li-Ion, Li-Polymer batteries
  - click and pop -protection SM-POWER also integrates a charging function for Li-Ion, Li-Polymer batteries
  - Precharge current source with two current levels
  - Constant current / constant voltage charging with 3 different termination voltages
  - Programable charge current limitation for use with different batteries
  - Freely programmable pulse charging to reduce the thermal power dissipation in the constant voltage charging phase
  - Top-off charge current sensing SM-POWER completes the USB interface of S-GOLD
  - Regulated voltage for S-GOLD USB interface including reverse current and overvoltage protection
  - Switch to supply USB pull-up resistor
  - Mini-host pull down resistor functionality
  - Charge pump with internal switching capacitor for USB host VBUS supply voltage SM-POWER fully supports LED and Vibra Motor functionality
  - no external components needed
  - driver for backlight LEDs adjustable in steps up to 140mA and with soft turn on and off by PWM dimming
  - two driver outputs for single LEDs for precharge indication and signaling with i.e. change of colour
  - driver for Vibra Motor with adjustable voltages, soft startup / shutdown and current limitation
- SM-POWER offers several control functions
- Power-on Reset Generator with logic state machine
  - I2C bus interface
  - I2C bus configurable mode control logic with ON (push-button or RTC), VCXOEN and LRF3EN (wake-up by Bluetooth) inputs
  - Programable interrupt channels to handle peripherals like SIM, MMC and USB
  - Monitoring of charging functions
  - Undervoltage Shut-Down
  - Errorflags (volatile or non-volatile) from many power-supply functions and thermal sensor in order to debug system
  - Overtemperature Shut-Down
  - Overtemperature Warning
  - Support of S-GOLD standby power-down concept
  - Support of S-GOLD Power-Down Pad Tristate Function

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**Table 6. LDO Output Table of SM-Power**

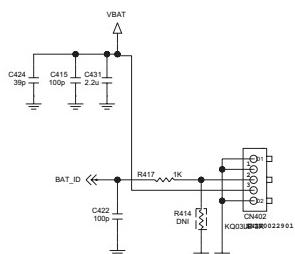
LDO	Net name	Output Voltage	Output Current	Usage
SD1	1V35_Core	1.35V	600mA	Core & for LDO
SD2	SD_1V8	1.8V	300mA	Memory
VAUX	VFM_2V9	2.9V	100mA	Cam Auto Focus
VIO	VIO_2V62_	2.62V	100mA	Peripherals
VSIM	SIM_2V9	2.9V	70mA	SIM card
VMME	VMME_2V9	2.9V	150mA	u-SD
VUMTS	CAM_2.85	2.85V	110mA	Headset AMP
VUSB	VUSB	3.1V	40mA	Not used
VLED	VLED	2.9V	10mA	Not used
VAUDIOa	VAUDA_2V5	2.5V	200mA	Stereo headset, Mono earpiece
VAUDIOb	VAUDB_2V5	2.5V	50mA	Analog parts of S-Gold
VRF1	VRF_2V85	2.85V	150mA	2.85 V supply for SMARTi-PM RF transceiver
VRF2	VRF_1V5	1.53V	100mA	1.5 V supply for SMARTi-PM RF transceiver
VRF3	VBT_2V65	2.7V	150mA	Bluetooth
VPLL	VPLL_1V35	1.35V	30mA	S-GOLD3 PLL
VRTC	RTC_2V11	2.11V	4mA	Real Time Clock
VAFC	VAFC	2.65V	5mA	Not used
VVIB	CAM_A_2V8	2.8V	140mA	Camera



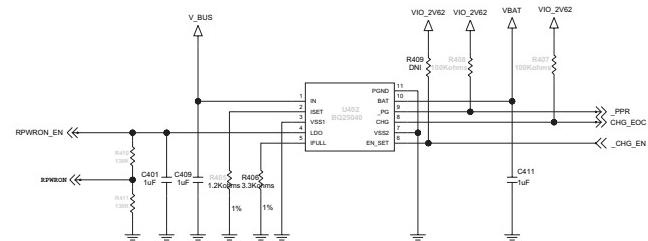
**Figure 3. SM-Power Circuit Diagram of GD510**

### 3. Technical brief

Battery Connector



Single Charging IC for uUSB



**Figure 4 SM-Power Circuit Diagram with charging part**

#### 3.3.2. Charging

SM-POWER provides an external AC-adapter a complete charge control function for charging of Li-Ion or Li-Ion-Polymer batteries. Either a 1-cell Li-Ion or Li-Ion-Polymer battery with 4.1, 4.2 or 4.4 Volts may be used.



**Figure 5 Battery Block Indications**

1. Charging method : CC-CV
2. Charger detect voltage : 4.0 V
3. Charging time : 2h 40m
4. Charging current : 380 mA
5. CV voltage : 4.2 V
6. Cutoff current : 110 mA
7. Full charge indication current (icon stop current) : 110 mA
8. Recharge voltage : 4.16 V
9. Low battery alarm
  - a. Idle : 3.43 V ~ 3.3 V
  - b. Dedicated : 3.53 V ~ 3.3 V
10. Low battery alarm interval
  - a. Idle : 3 min
  - b. Dedicated : 1 min
11. Switch-off voltage : 3.3 V
12. Charging temperature adc range
  - a. ~ -5°C : low charging voltage operation (3.6 V ~ 3.9 V) .
  - b. -5°C ~ 50°C : standard charging (up to 4.2 V)
  - c. 50°C ~ : low charging voltage operation (3.6V ~ 3.9V)

#### 3.4. Power ON/OFF

GD510 Power State: Defined 3cases as follow

- ▶ Power-ON: Power key detect (SM-Power's ON port)
- ▶ Power-ON-charging: Charger detect.

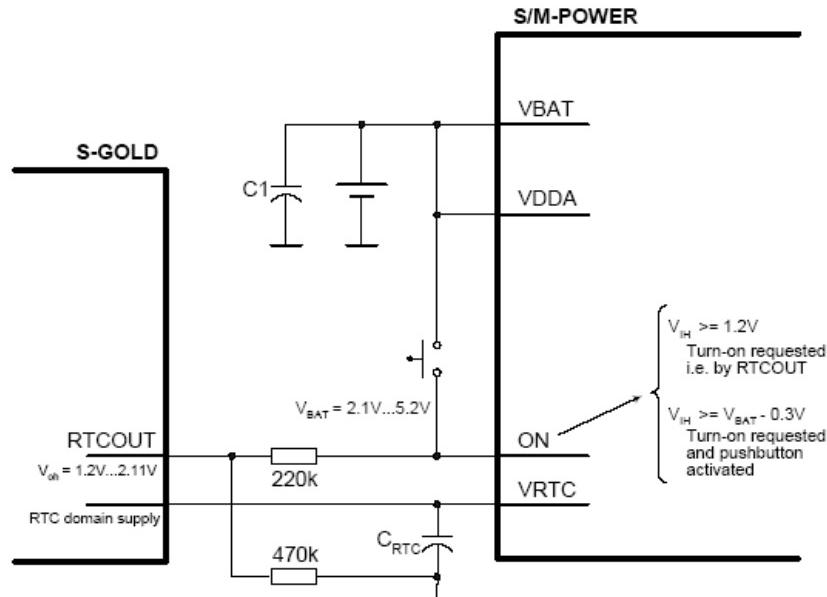
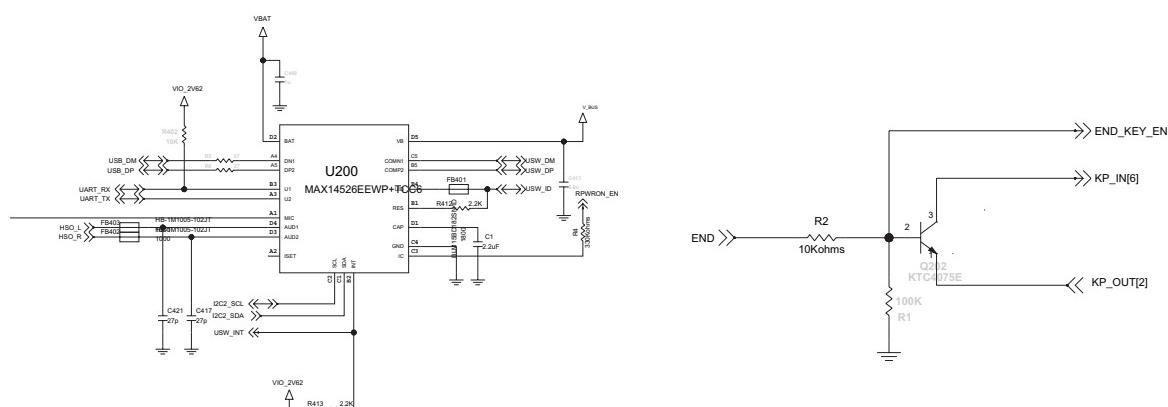


Figure 6 Power on application.

Input ON is a power-on input for SM-POWER with 2 active high levels (see Figure 6). It might be triggered by a push button or by the RTCOUT output of the S-GOLD device as well. To detect if the push-button is pressed during system operation the logical level at pin ON or its change (if Bit 1 EION in INTCTRL2 is asserted) is recorded in bit LON of the ISF register. If the high level of voltage at pin ON does not reach VIHdet ( $V_{bat}-0.8 \sim V_{bat}-0.3$ ) the above-mentioned bit won't be set.

To support Remote power on function for factory mass production, applied an analog switch as following figure. As monitoring the RPWRON and Key matrix KP\_OUT(2) & KP\_IN (6), GD510 system recognize whether remote power on or End-key pushed



### 3. Technical brief

#### 3.5. SIM & uSD interface

GD510 supports 1.8V & 2.9V plug in SIM, SIM interface scheme is shown in (Figure 8).  
SIM\_IO, SIM\_CLK, SIM\_RST ports are used to communicate with BBP(S-Gold3) and the SIM power supply enabled by PMIC.

##### SIM Interface

SIM\_CLK : SIM card reference clock  
SIM\_RST : SIM card Async /sync reset  
SIM\_IO : SIM card bidirectional reset

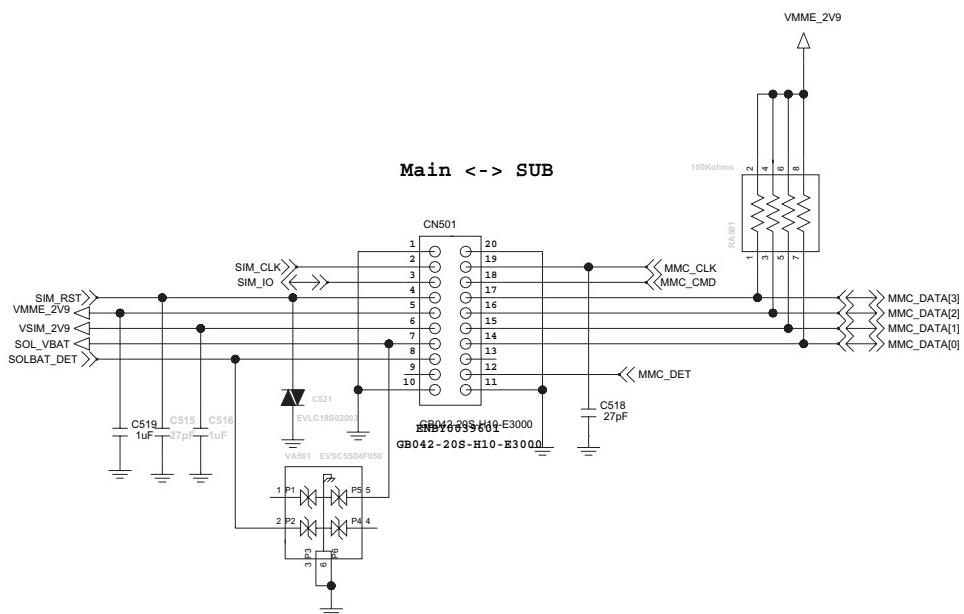
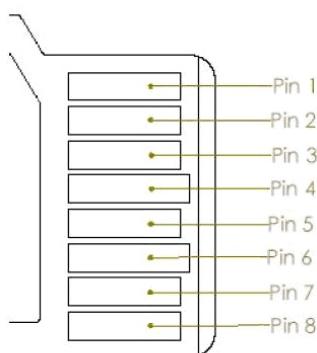


Figure 8 SIM & Micro SD Circuit

The MicroSD Memory Module has eight exposed contacts on one side. The S-Gold3 is connected to the module using a dedicated eight-pin connector



Micro SD Memory Card Detection Scheme

### 3. Technical brief

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#### Micro SD memory pad assign.

SD mode			
Pin No.	Name	Type	Description
1	DAT2	I/O	Data bit [2]
2	CD/DAT3	I/O	Data bit [3]
3	CMD	I/O	Command response
4	VDD	Power	Power supply
5	CLK	I	Clock
6	VSS	Ground	Power ground
7	DAT0	I/O	Data bit [0]
8	DAT1	I/O	Data bit [1]

### 3. Technical brief

#### 3.6. Memory

2Gbit NAND & 1Gbit DDRSDRAM employed on GD510 with 8 & 16 bit parallel data bus thru ADD(0) ~ ADD(29). The 2Gbit Nand Flash memory with DDRAM stacked device family offers multiple high-performance solutions.

Large Block Memory  
(2048Mbit NAND / 1024 Mbit DDR SDRAM, 1.8V I/O)

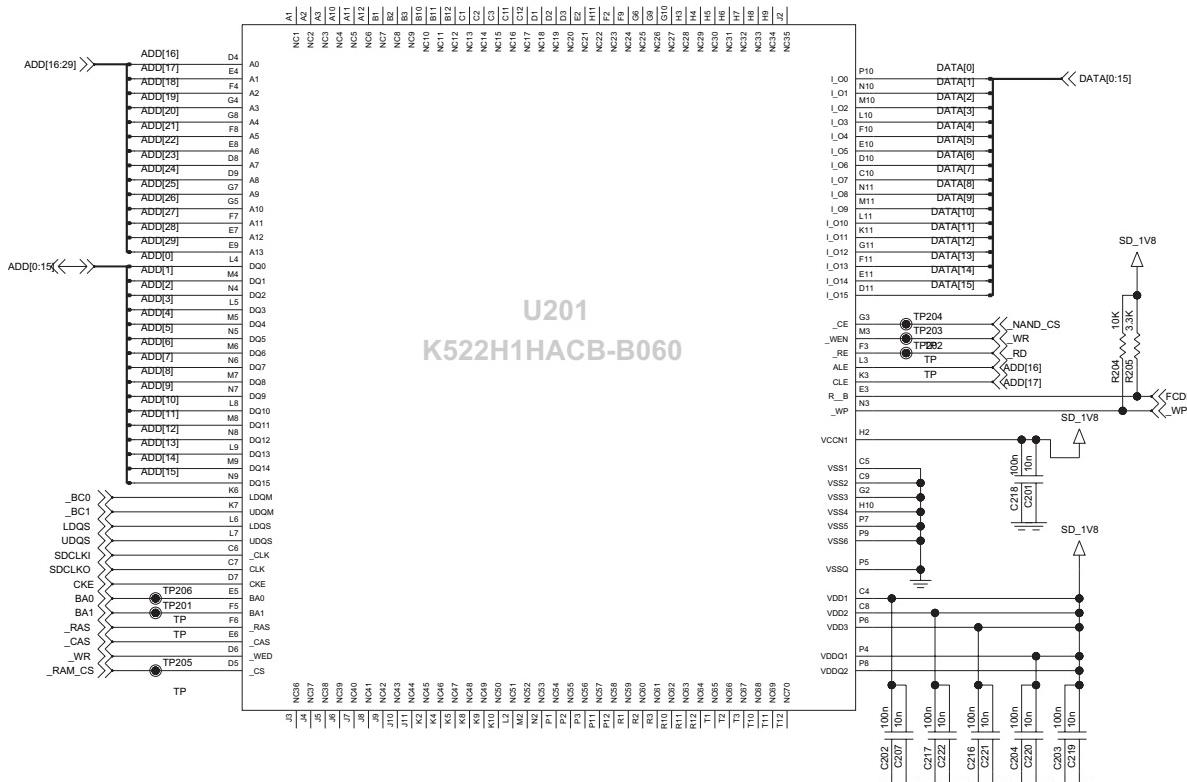


Figure 9 Flash memory & DDR RAM MCP circuit diagram

## 3.7. LCD Display

LCD module include:

- Main LCD: 3.0" 240x400 WQVGA, 262K color TFT
- Backlight : 5 piece of white LED

### LCD FPC Interface Spec:

**Table 7. LCD FPC Interface Spec.**

Pin No	Symbol	Description	I/O	Remarks
1	GND	GND level pin	-	
2	VSYNC_IN	External VSYNC input	-	Unused :connected to VDDIO or GND
3	MARKER_ID	MARKER_ID pin = "LOW(GND)"	-	
4	LEDA	LED1~5 Anode Common	-	
5	LEDC1	LED1 Cathode	-	
6	LEDC2	LED2 Cathode	-	
7	LEDC3	LED3 Cathode	-	
8	LEDC4	LED4 Cathode	-	
9	LEDC5	LED5 Cathode	-	
10	GND	GND level pin	-	
11	IF_MODE_1	Bus width setting	I	Note 1)
12	RS	Data / Command selectable	I	High(VDDIO) : Access to data Low(GND) : Access to Index
13	CS	Chip Select	I	Low(GND) enable
14	RESETB	Reset enable	I	Low(GND) enable
15	RD	Read enable	I	Low(GND) enable
16	WR	Write enable	I	Low(GND) enable
17	VSYNC_O	Tearing Effect Output	O	
18	OPEN(OTP)	(OTP Program pin)	I	Don't care (open)
19	IF_MODE_0	Bus width setting	I	Note 1)
20	GND	GND level pin	-	
21	GND	GND level pin	-	
22	D15	Data Bus	I/O	
23	D14	Data Bus	I/O	
24	D13	Data Bus	I/O	
25	D12	Data Bus	I/O	
26	D11	Data Bus	I/O	
27	D10	Data Bus	I/O	
28	D9	Data Bus	I/O	
29	D8	Data Bus	I/O	
30	D7	Data Bus	I/O	
31	D6	Data Bus	I/O	
32	D5	Data Bus	I/O	
33	D4	Data Bus	I/O	
34	D3	Data Bus	I/O	
35	D2	Data Bus	I/O	
36	D1	Data Bus	I/O	
37	D0	Data Bus	I/O	
38	VCC	Power supply for analog	-	
39	VDDIO	Power supply for I/O	-	
40	GND	GND level pin	-	

### 3. Technical brief

#### 3.8. Keypad Switching & Scanning

The keypad interface is a peripheral which can be used for scanning keypads up to 3 rows (outputs from Port Control Logic) and 2columns (inputs to PCL). The number of rows and columns depend on settings of the PCL.

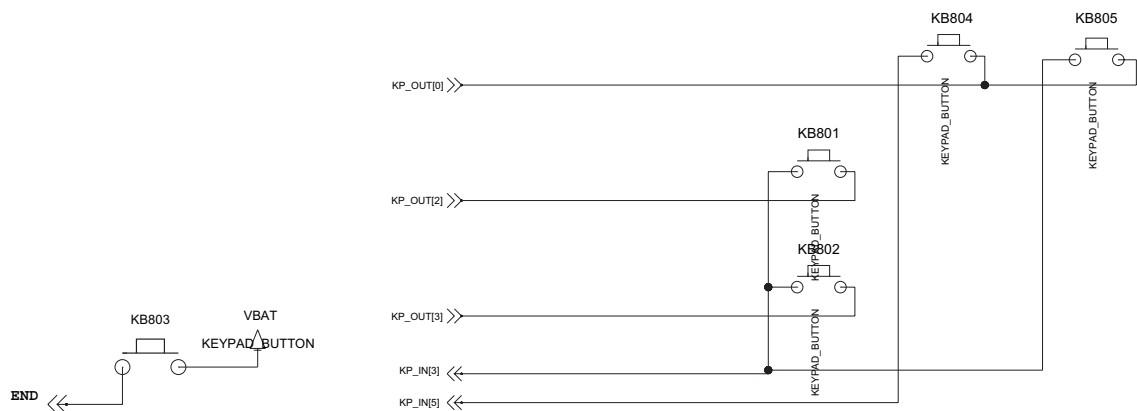


Figure 10 Key pad part key matrix

#### 3.9. Keypad back-light illumination

There are 2 snow white color LEDs on Key FPCB for keypad illumination. Keypad Back-light is controlled by SM-Power Flash LED port which has constant current control function. The whole configuration of the SM-POWER Flash LED drivers is shown in below Figure11.

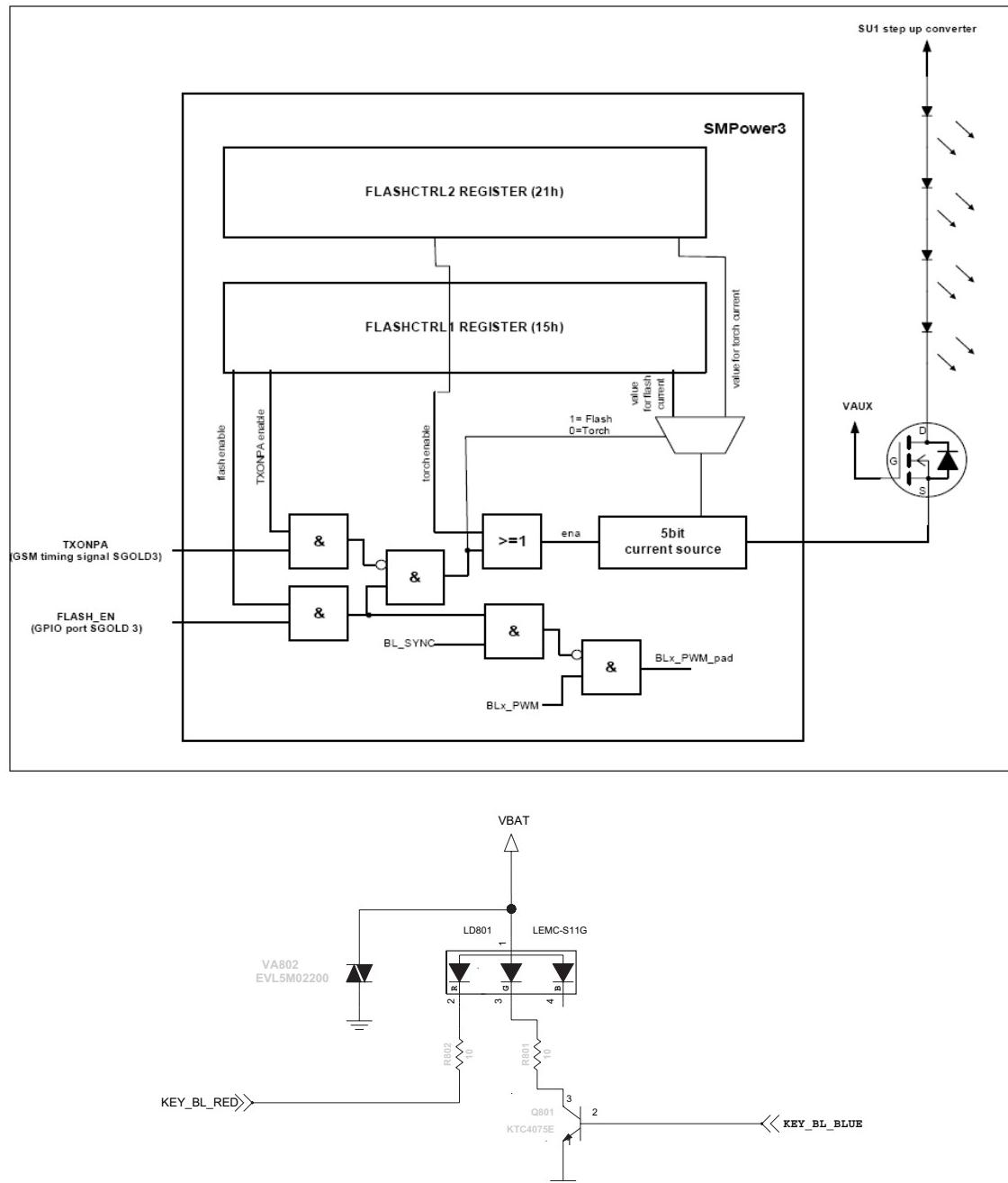


Figure 11 Keypad Back-light LEDs

### 3. Technical brief

#### 3.10. LCD back-light illumination

The SC654 is a high efficiency charge pump LED driver using Semtech's proprietary charge pump technology. Performance is optimized for use in single-cell Li-ion battery applications.

LCD Backlight

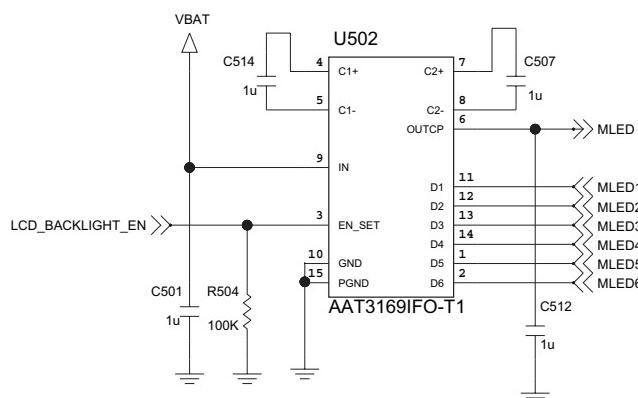


Figure 12 LCD Back light unit and Flash LED charge pump IC

The AAT3169 is a write-only single wire interface. It provides access to up to 32 registers that control device functionality. In this system, two sets of pulse trains are transmitted via the SPIF pin. The first pulse set is used to set the desired address. After the bus is held high for the address hold period, the next pulse set is used to write the data value. After the data pulses are transmitted the bus is held high again for the data hold period to signify the data write is complete. At this point the slave device latches the data into the address that was selected by the first set of pulses. The protocol for using this interface is described in the following subsection.

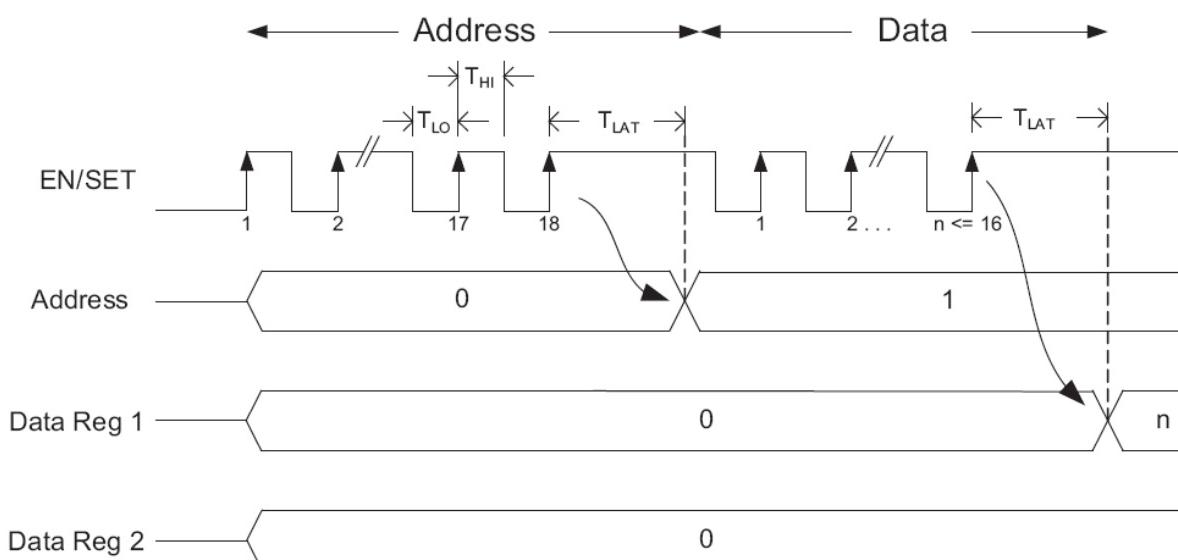
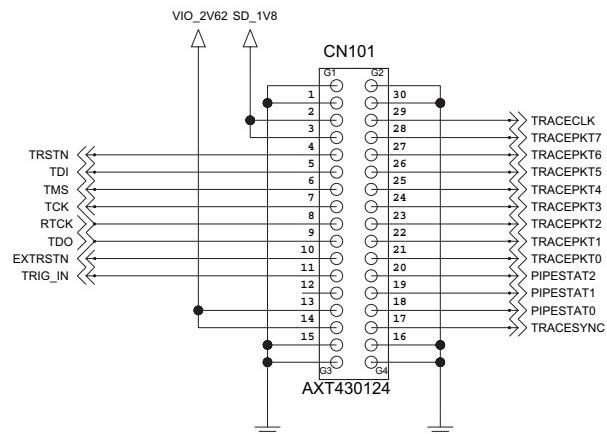


Figure 13 I2C Serial data port control method

### **3.11 JTAG & ETM interface connector**



**Figure 15 JTAG & ETM(Embedded Trace Module) interface connector**

In case of GD510 mass production, the JTAG & ETM interface connector will not be mounted on board. That is only for developing and software debugging purpose.( It will not be mounted on mass production PCB)

### 3. Technical brief

#### 3.12. Audio

GD510 Audio signal flow diagram as following diagram.

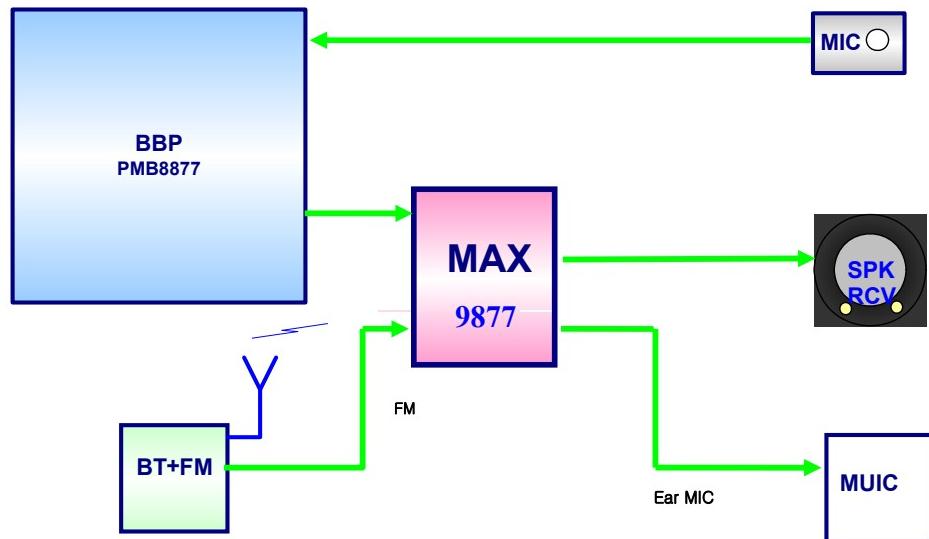


Figure 16 Audio signal flow diagram

##### 3.12.1. Audio amplifier

Audio amplifier sub system IC is an audio power amplifier capable of delivering 1.2 W of continuous average power into a mono 8Ω load, 50mW per channel of continuous average power into stereo 32Ω single-ended (SE) loads. The MAX9877 features a 32-step digital volume control and ten distinct output modes. The digital volume control, output modes (mono/SE/OCL) are programmed through a two-wire I2C interface that allows flexibility in routing and mixing audio channels.

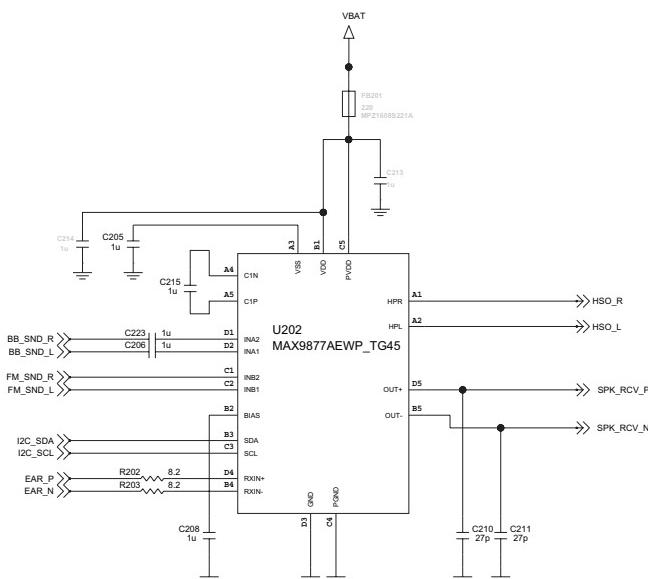
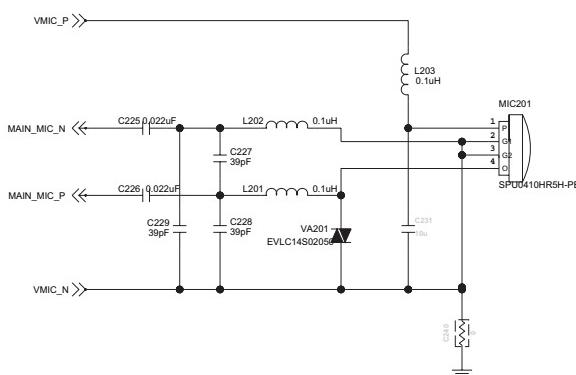


Figure 17 Audio amplifier PMIC

### 3.12.2. Microphone circuit

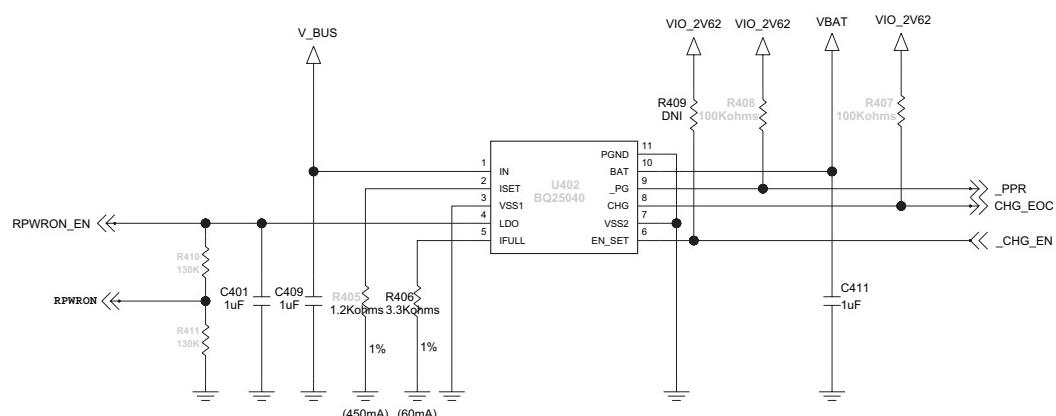
MIC



**Figure 18 Microphone circuit**

### 3.13. Charging circuit

BQ25045 accepts one power input from a USB (Universal Serial Bus) port or desktop cradle. The BQ25045 features maximum voltages for the cradle and the USB inputs respectively. Due to the 30V rating for the cradle input, low-cost, large output tolerance adapters can be used safely.



**Figure 19 Charging circuit**

### **3. Technical brief**

### **3.14 FM radio & BLUETOOTH**

- FM radio

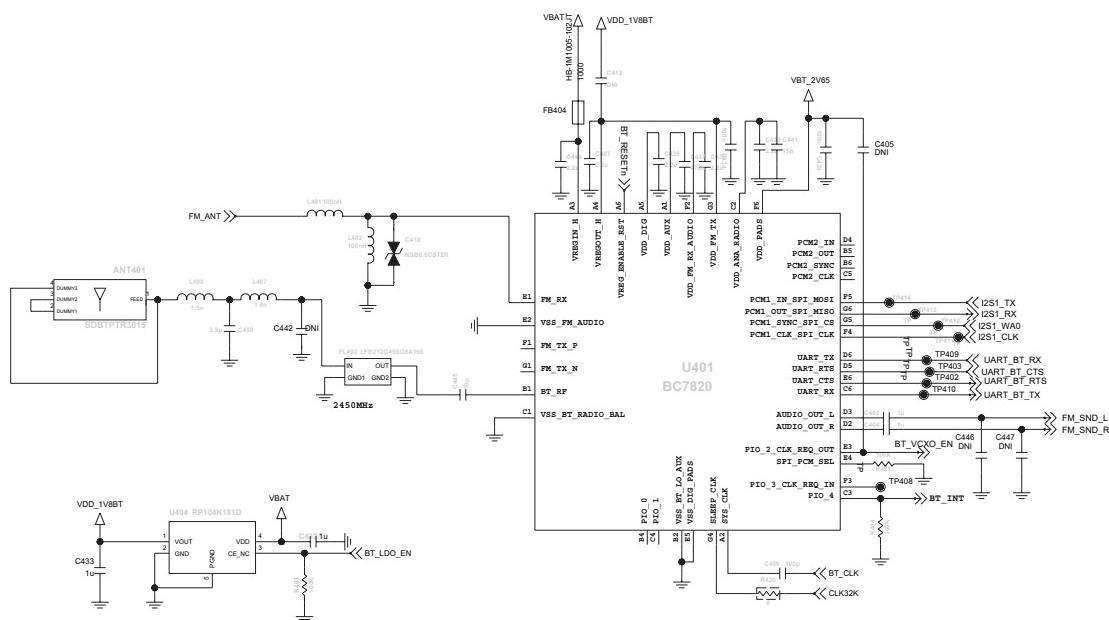
#### Simultaneous operation with Bluetooth

- Support of US/Europe (87.5 to 108 MHz) and Japanese (76 to 90 MHz) FM band
  - Wide dynamic range AGC
  - Soft mute and stereo blend
  - Adjustment-free stereo decoder and AFC
  - Autonomous search tuning function (up/down) with programmability (threshold setting)
  - RDS demodulator
  - Audio output available over Bluetooth audio interface or dedicated audio output
  - Control of FM via Bluetooth HCI or I2C
  - Adaptive filter to suppress narrow band interference in the FM channel

- Bluetooth

## **Bluetooth General Features**

- Small outline by LTCC substrate built-in RF function and Resin mold
  - Integrated top BPF for Bluetooth and FM radio
  - Integrated RDS/RBDS demodulator and decoder
  - **Bluetooth® 2.1+EDR** conformity
  - Secure Simple Pairing (SSP)
  - Encryption Pause Resume (EPR)
  - Enhance Inquiry Response (EIR)
  - Link Supervision Time Out (LSTO)
  - Sniff Sub Rating (SSR)
  - Erroneous Data (ED)
  - Packet Boundary Flag (PBF)
  - WLAN coexistence including 802.15.2 three-wire coexistence support
  - UART Interface
  - PCM Interface
  - I<sub>2</sub>S Interface
  - I<sub>2</sub>C Interface



**Figure 20. Bluetooth / FM Radio Circuit Diagram**

#### Bluetooth Radio

- Common TX/RX terminal simplifies external matching, eliminates external antenna switch
- No external trimming is required In production
- Bluetooth v2.1 + EDR Specification compliant

#### Bluetooth Transmitter

- +6 dBm RF Transmit power with level control from on-chip 6-bit DAC over a dynamic range > 30dB
- Class 1 and Class 2 support without the need for an external power amplifier or TX/RX switch.

#### Bluetooth Receiver

- Integrated channel filters
- Digital demodulator for improved sensitivity and co-channel rejection
- Real time digitized RSSI available on HCI interface
- Fast AGC for enhanced dynamic range
- Channel classification for AFH

#### Synthesizer

- Fully integrated synthesizer requires no external VCO varactor diode, resonator or loop filter
- Compatible with crystals between 7.5 and 40MHz (in multiples of 250KHz) or an external clock

#### Audio

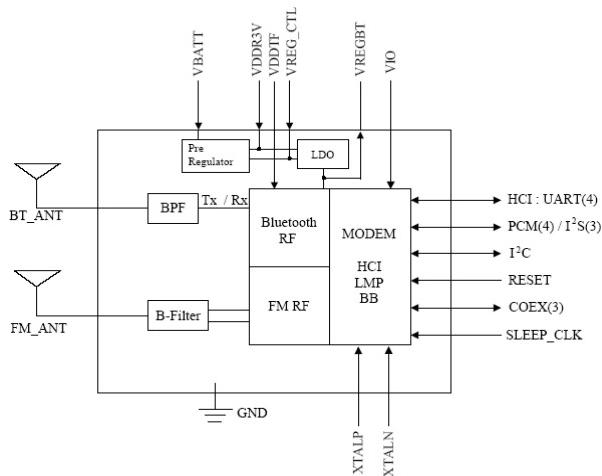
- Single-ended stereo analogue output
- 16-bit 48 kHz digital audio bit stream output

#### Baseband and Software

- Internal 48Kbyte RAM, allows full speed data transfer, mixed voice and data, and full piconet operation, including all medium rate packet types
- Logic for forward error correction, header error control, access code correlation. CRC, demodulation, encryption bit stream generation, whitening and transmit pulse shaping. Supports all Bluetooth v 2.0 + EDR features incl. ESCO and AFH
- Transcoders for A-law, u-law and linear voice from host and A-law, u-law and CVSD voice over air

#### Physical Interfaces

- Synchronous serial interface up to 4Mbits/s for system debugging
- UART interface with programmable baud rate up to 4Mbits/s with an optional bypass mode
- USB v1.1 interface
- I2C slave for FM
- Two audio PCM interfaces (input and output)
- Analogue stereo (output only)



**Figure 21. Bluetooth / FM Radio Block Diagram**

### 3. Technical brief

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#### 3.15. u-USB Multi Media Interface connector

Table 8. Multi media interface pin assign

	KF500 MMI	
	Pin Function	Description
1	V_BUS	Charger voltage
2	USW_DM	USB/ Remote control Key ADC/ Headset left sound
3	USW_DP	USB/ Remote control interrupt/ Headset Right sound
4	USW_ID	
5	GND	Power GND
6	GND	Power GND
7	GND	Power GND
8	FM_ANT	FM radio antenna / Audio ground
9	NC	
10	VBAT	FM radio antenna / Audio ground
11	NC	

u-USB

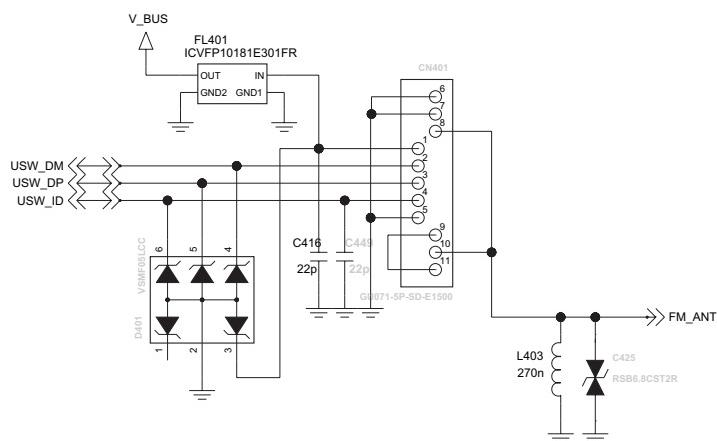


Figure 22. u\_USB Connector circuit

## 3-2. RF circuit

### \*RF Block Diagram

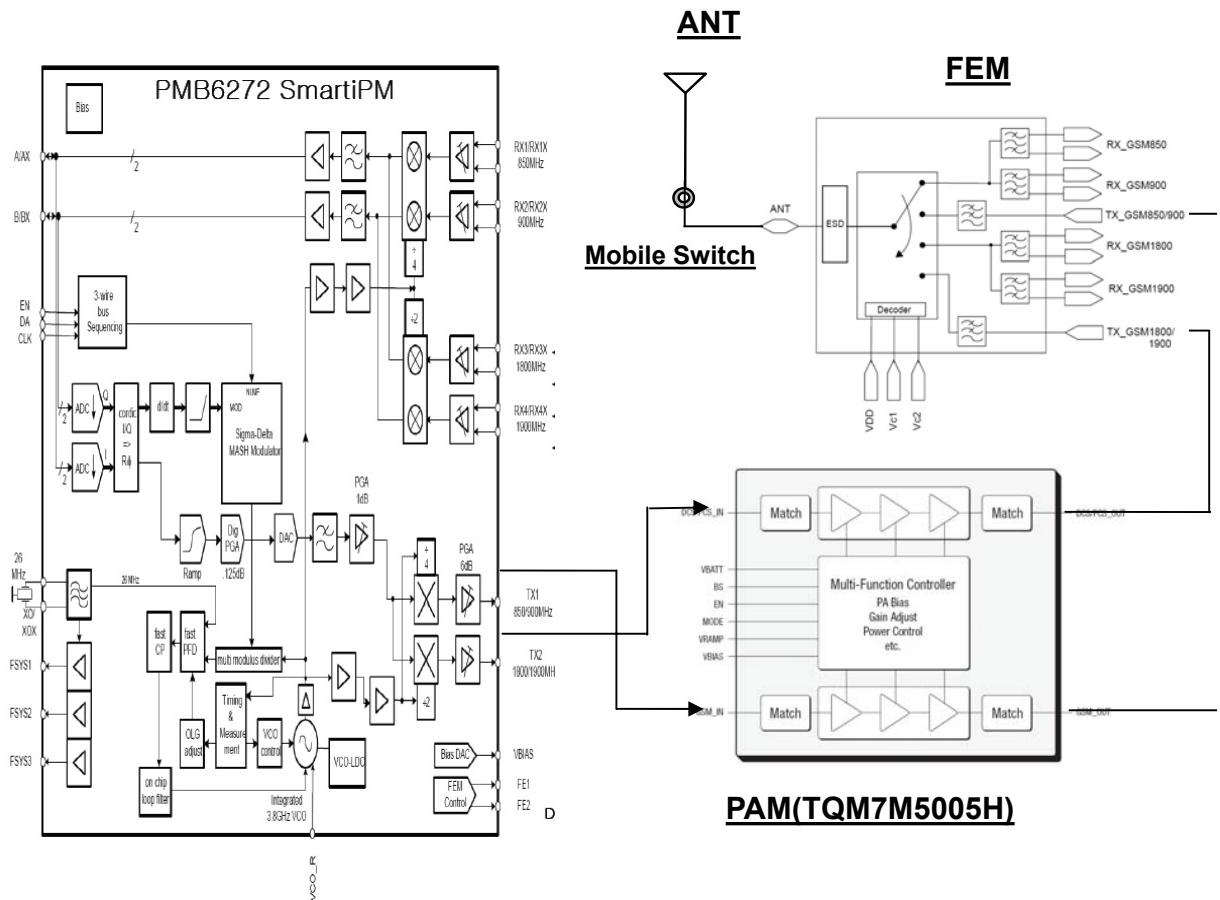


Figure 23 GD510 RF part Block Diagram

### 3. Technical brief

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#### 3.16. General Description

The RF transceiver (PMB 6272 SMARTi-PM) is an integrated single chip, quad-band transceiver for GSM850/GSM900/GSM1800/GSM1900 designed for voice and data transfer applications. The transceiver provides an analog I/Q baseband interface and consists of a direct conversion receiver and a quad-band polar transmitter for GSM and EDGE with integrated PGA functionality. Further on a completely integrated SD-synthesizer with HSCSD and GPRS/EDGE capability, a digitally controlled reference oscillator with three outputs, a fully integrated quad-band RF oscillator and a three wire bus interface with all necessary control circuits complete the transceiver.

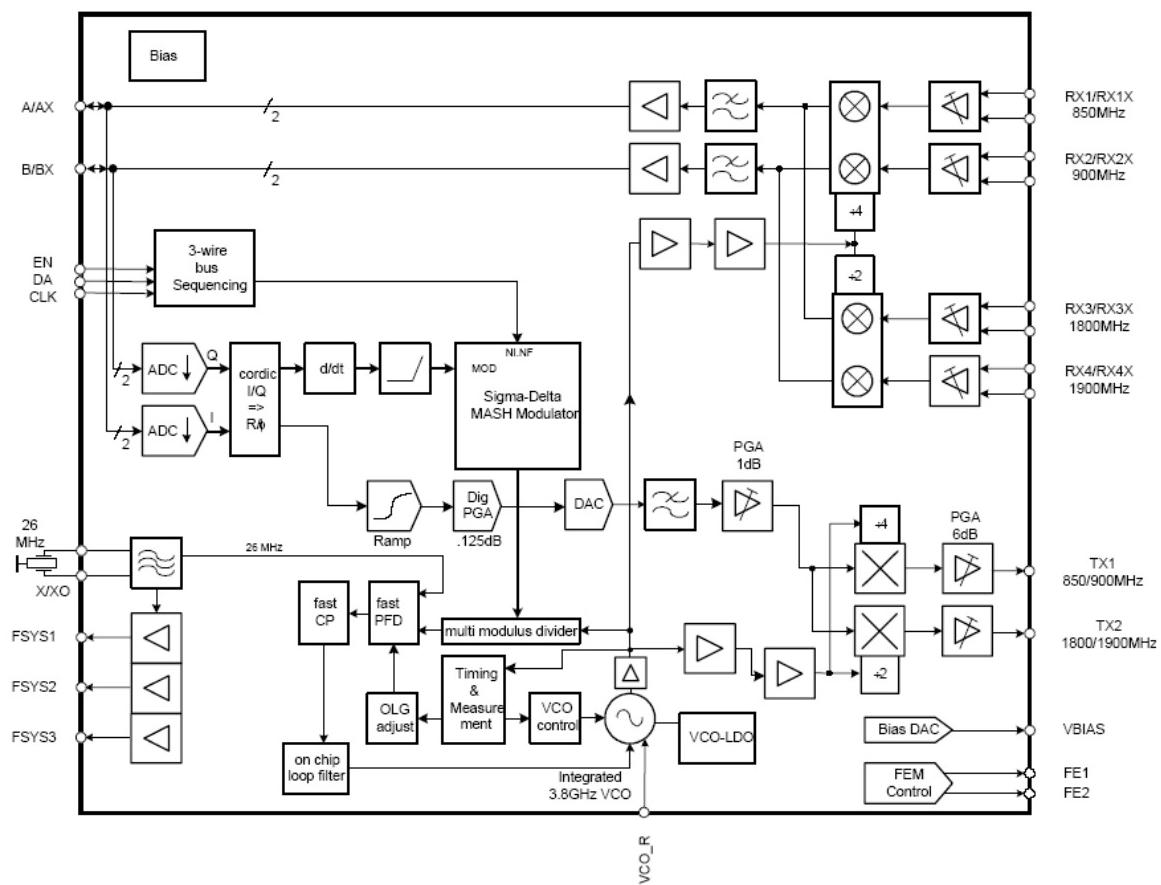


Figure 24 RF transceiver PMB6272 SMARTi-PM functional block diagram

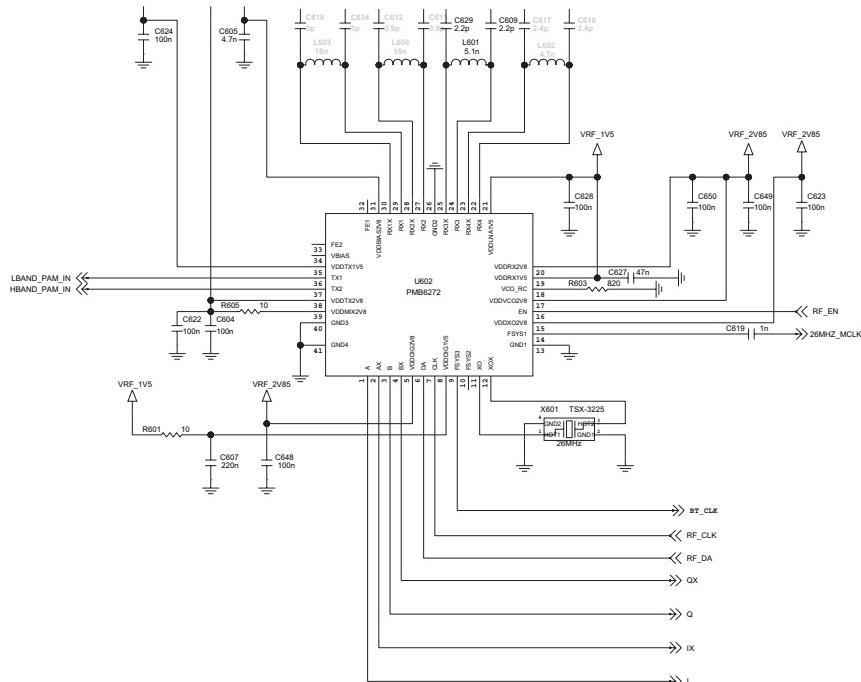


Figure 25 RF transceiver PMB6272 SMARTi-PM schematic

### 3.17. Receiver part

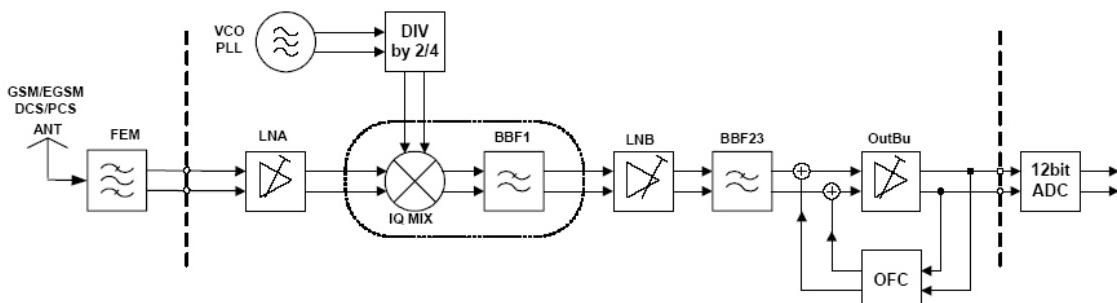


Figure 26 Receiver part block diagram

The constant gain direct conversion receiver contains all active circuits for a complete receiver chain for GSM/GPRS/EDGE (see Figure 39). The GSM850/900/DCS1800/PCS1900 LNAs with balanced inputs are fully integrated. No inter-stage filtering is needed. The orthogonal LO signals are generated by a divider-by-four for GSM850/900 band and a divider-by-two for the DCS1800/PCS1900 band. Down conversion to baseband domain is performed by low/high band quadrature direct down conversion mixers. The baseband chain contains a LNB (low noise buffer), channel filter, output buffer and DC-offset compensation. The 3rd order low pass filter is fully integrated and provides sufficient suppression of blocking signals as well as adjacent channel interferers and avoids anti-aliasing through the baseband ADC. The receive path is fully differential to suppress on-chip interferences. Several gain steps are implemented to cope with the dynamic range of the input signals. Depending on the baseband ADC dynamic range, single- or multiple gain step switching schemes are applicable. Furthermore an automatic DC-offset compensation can be used (depending on the gain setting) to reduce the DC-offset at baseband-output. A programmable gain correction can be applied to correct for front end- and receiver gain tolerances.

### 3. Technical brief

#### 3.18. Transmitter part

The GMSK transmitter supports power class 4 for GSM850 and GSM900 as well as power class 1 for DCS1800 and PCS1900. The digital transmitter architecture is based on a very low power fractional-N Sigma-Delta synthesizer without any external components (see Figure39). The analog I/Q modulation data from the baseband is converted to digital, filtered and transformed to polar coordinates. The phase/frequency signal is further processed by the Sigma-Delta modulation loop. The output of its associated VCO is divided by four or two, respectively, and connected via an output buffer to the appropriate single ended output pin. This configuration ensures minimum noise level. The 8PSK transmitter supports power class E2 for GSM850 and GSM900 as well as for DCS1800 and PCS1900. The digital transmitter architecture is based on a polar modulation architecture, where the analog modulation data (rectangular I/Q coordinates) is converted to digital data stream and is subsequently transformed to polar coordinates by means of a CORDIC algorithm. The resulting amplitude information is fed into a digital multiplier for power ramping and level control. The ready processed amplitude signal is applied to a DAC followed by a low pass filter which reconstructs the analog amplitude information. The phase signal from the CORDIC is applied to the Sigma-Delta fractional-N modulation loop. The divided output of its associated VCO is fed to a highly linear amplitude modulator, recombining amplitude and phase information. The output of the amplitude modulator is connected to a single ended output RF PGA for digitally setting the wanted transmit power. The PA interface of SMARTi-PM supports direct control of standard dual mode power amplifiers (PA's) which usually have a power control input VAPC and an optional bias

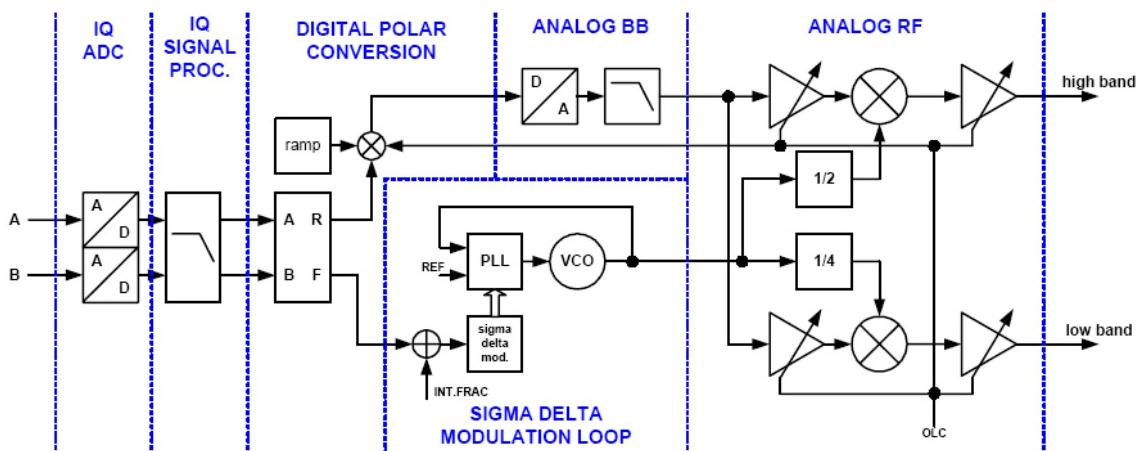


Figure 27 Transmitter part block diagram

control pin VBIAS for efficiency enhancement. In GMSK mode, the PA is in saturated high efficiency mode and is controlled via its VAPC pin directly by the baseband ramping DAC. In this way both up- / down-ramping and output power level are set. In 8PSK mode, the ramping functionality is assured by an on-chip ramping generator, whereas output power is controlled by the PGA's as described above.

## 3.19. RF synthesizer

The transceiver contains a fractional-N sigma-delta synthesizer for the frequency synthesis in the RX operation mode. For TX operation mode the fractional-N sigma-delta synthesizer is used as Sigma-Delta modulation loop to process the phase/frequency signal. The 26MHz reference signal is provided by the internal crystal oscillator. This frequency serves as comparison frequency of the phase detector and as clock frequency for all digital circuitry. The divider in the feedback path of the synthesizer is carried out as a multi-modulus divider (MMD). The loop filter is fully integrated and the loop bandwidth is about 100 kHz to allow the transfer of the phase modulation. The loop bandwidth is automatically adjusted prior to each slot (OLGA<sup>2</sup>). To overcome the statistical spread of the loop filter element values an automatic loop filter adjustment (ALFA) is performed before each synthesizer startup. The fully integrated quad-band VCO is designed for the four GSM bands (850, 900, 1800, 1900 MHz) and operates at double or four times transmit or receive frequency. To cover the wide frequency range the VCO is automatically aligned by a binary automatic band selection (BABS) before each synthesizer startup.

## 3.20. DCXO

The SMARTiPM contains a fully integrated 26MHz digitally controlled crystal oscillator (DCXO) with three outputs for the system clock, one output for the GSM baseband and two additional for other subsystems (GPS, Bluetooth, etc.). The only external part of the oscillator is the crystal itself. The frequency tuning is performed along the selected subrange by programming the frequency control word (XO\_TUNE) via the three wire bus ("3Wbus")

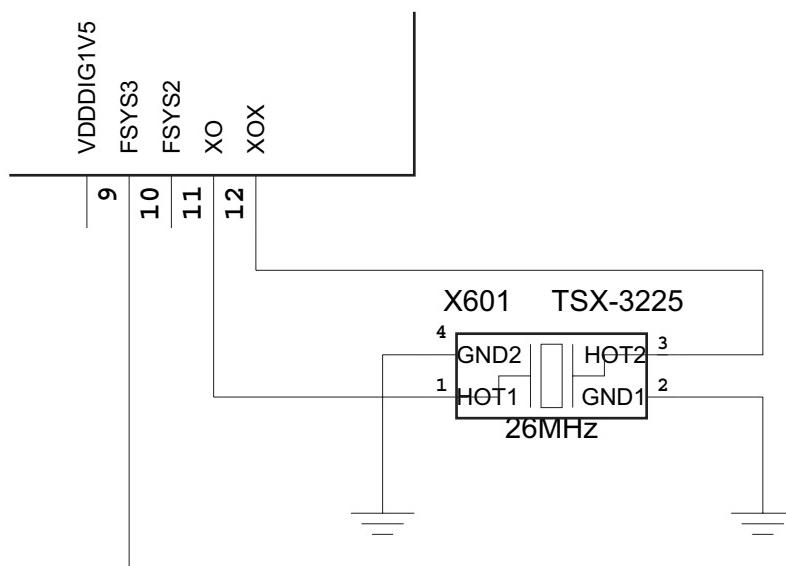


Figure 28 DCXO Schematic

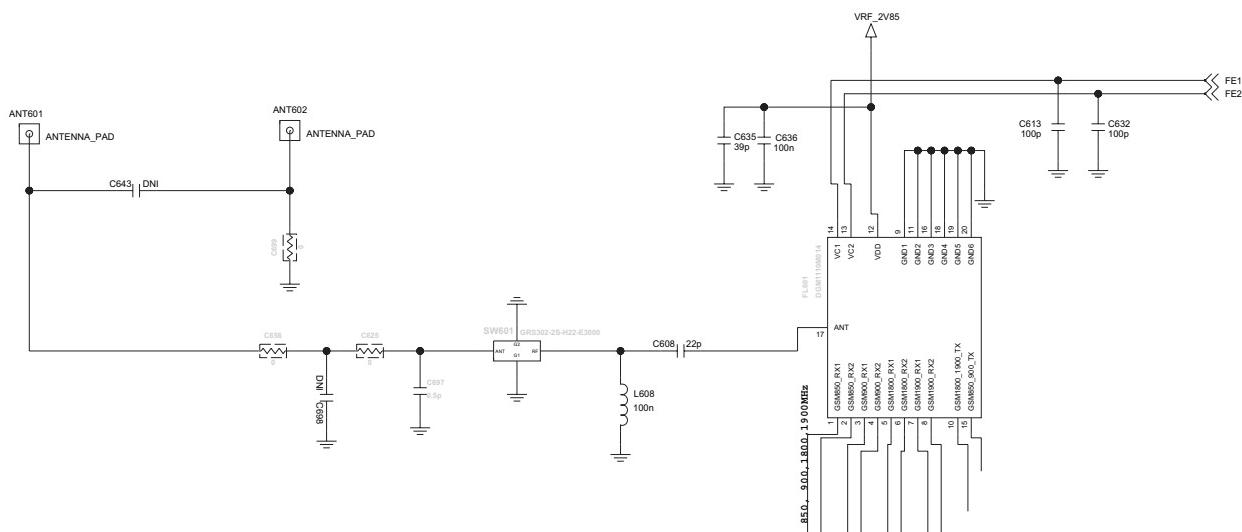
### 3. Technical brief

#### 3.21. Front End Module control

Implemented in the S-Gold3 (FL600) are two outputs which are FE1, FE2 for direct control of front end modules with two logic input pins to select RX and TX mode as well as low and high band operation. FEM need 2V85\_VRF supply.

**Table 9 FEM Control Logic**

MODE	Tx 1GHz	Tx 2GHz	Rx 1GHz	Rx 2GHz
VDD	ON	ON	ON	ON
VC1	OFF	ON	OFF	ON
VC2	ON	ON	OFF	OFF



**Figure 29 FEM schematic**

## 3.22. Power Amplifier Module

The TQM7M5005H Power Amplifier Module(PAM) is designed in a compact form factor for quad-band cellular handsets comprising GSM850/900, DCS1800, PCS1900, supporting GMSK and linear EDGE modulation. Class12 General Packet Radio Service(GPRS) multi-slot operation is also supported. The module consists of a GSM850/900 PA block and a DCS1800/PCS1900 PA block, impedance matching circuitry for 50ohm input and output impedances, and a Multi-function Power Amplifier Control(MFC) block. A custom CMOS integrated circuit provides the internal MFC function and interface circuitry.

Two separate Heterojunction Bipolar Transistor(HBT) PA blocks are fabricated onto InGaP die; one supports the GSM850/900 bands, the other supports the DCS1800 and PCS1900 bands. Both PA blocks share common power supply pins to distribute current. The InGaP die, the silicon die, and the passive components are mounted on a multi layer laminate substrate. The assembly is encapsulated with plastic overmold.

RF input and output ports are internally matched to 50ohm to reduce the number of external components. Extremely low leakage current(2.5uA) maximizes handset standby time. Band select(BS) circuitry select GSM transmit frequency band(logic0) and DCS/PCS transmit frequency(logic1). MODE circuitry selects GMSK modulation (logic0) or EDGE modulation(logic1). VRAMP controls the output power for GMSK modulation and provides bias optimization for EDGE modulation depending on the state of MODE control.

The integrated multi-function(MFC) provides envelope amplitude control in GMSK mode, reducing sensitivity to input drive, temp, power supply, and process variation. In EDGE mode, the MFC configures the PA for fixed gain, and provides the ability to optimize the PA bias operation at different power levels. This circuitry regulates PA bias conditions, reducing sensitivity to temp., power supply, and process variation. The Enable input signal(pin8) provides a standby state to minimize battery drain..

**Table 10 PAM pin description**

Pad	Name	Description
1	MODE	GMSK/EDGE Power Control Mode: Low = GMSK, High = EDGE
2	DCS/PCS_IN	RF Input (DCS / PCS Bands) DC Blocked
3	BS	Band Select
4	VBIAS	Analog PA Bias Control (ALL BANDS, EDGE MODE)
5	VBATT	DC Supply
6	VRAMP	Analog Output Power Control (ALL BANDS, GMSK MODE)
7	GSM_IN	RF Input (GSM / EGSM Bands) DC Blocked
8	EN	Transmit Enable / Disable. Low = Disable
9	GSM_OUT	RF Output (GSM / EGSM Bands) DC Blocked
*12	RSVD2	Reserved
*16	DCS/PCS_OUT	RF Output (DCS / PCS Bands) DC Blocked
*10, 11, 13-15	GND	Ground
Pad	GND PAD GRID	Ground pad grid is device underside.

### 3. Technical brief

#### 3.23. PAM Schematic

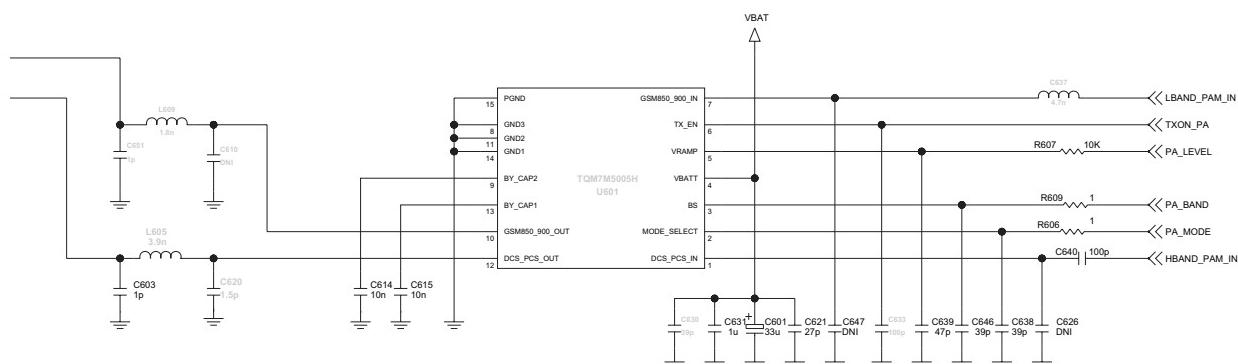
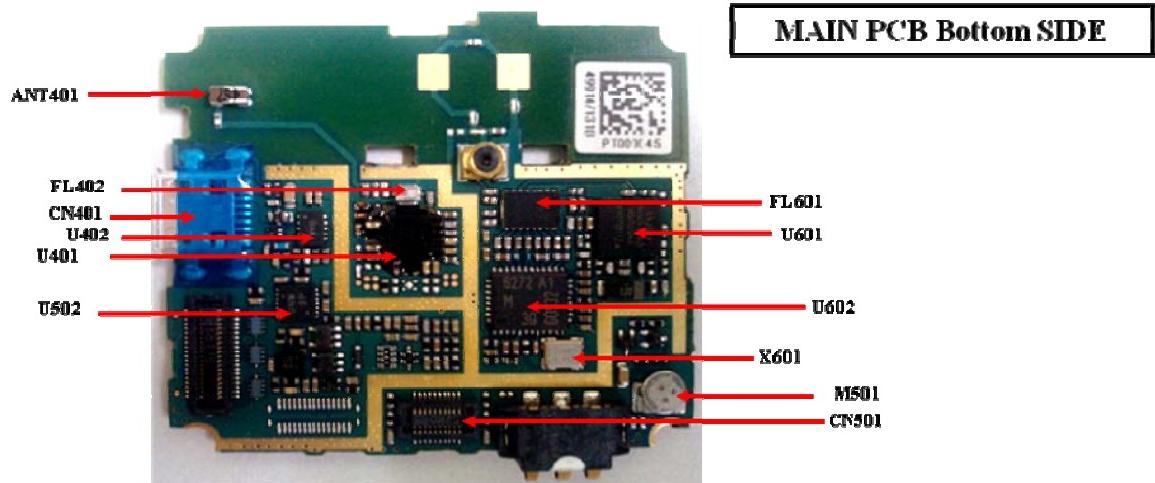


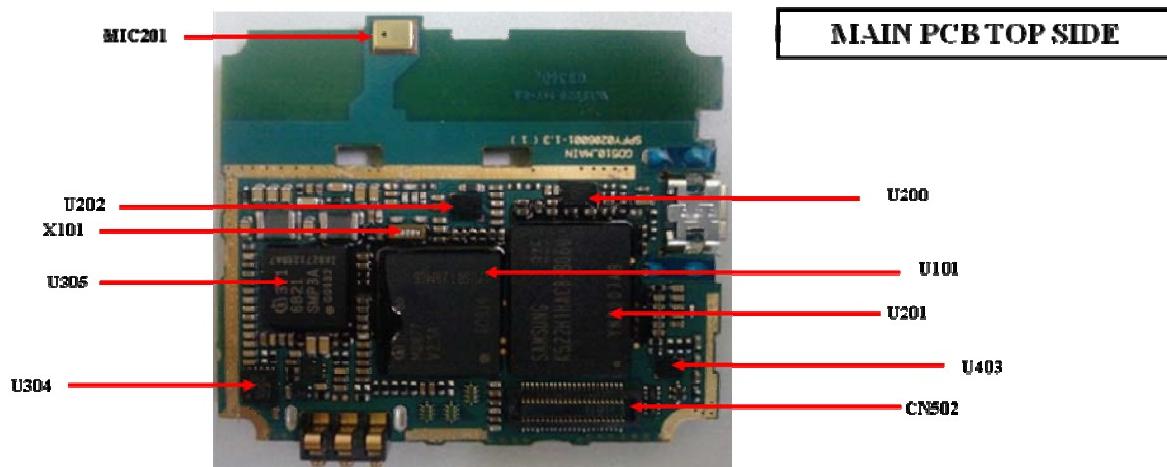
Figure 30 PAM schematic

### 4. PCB layout picture



Reference	Description	Reference	Description
FL601	Quan Band FEM(D5008)	M501	Backup Battery(PAS311HR-VGI)
CN501	20Pin Main → SUB Connector(offset type)	U601	PAM(TQM7M5005)
U602	RFTransceiver(PMB6272)	U402	Single Change IC for Uusb(BQ25040)
X601	26MHz X-tal(TSX-3225)	U401	BT + FM Radio IC(BC7820)
U502	Charge Pump(AAT3169IFO-TI)	FL402	Bluetooth BPF

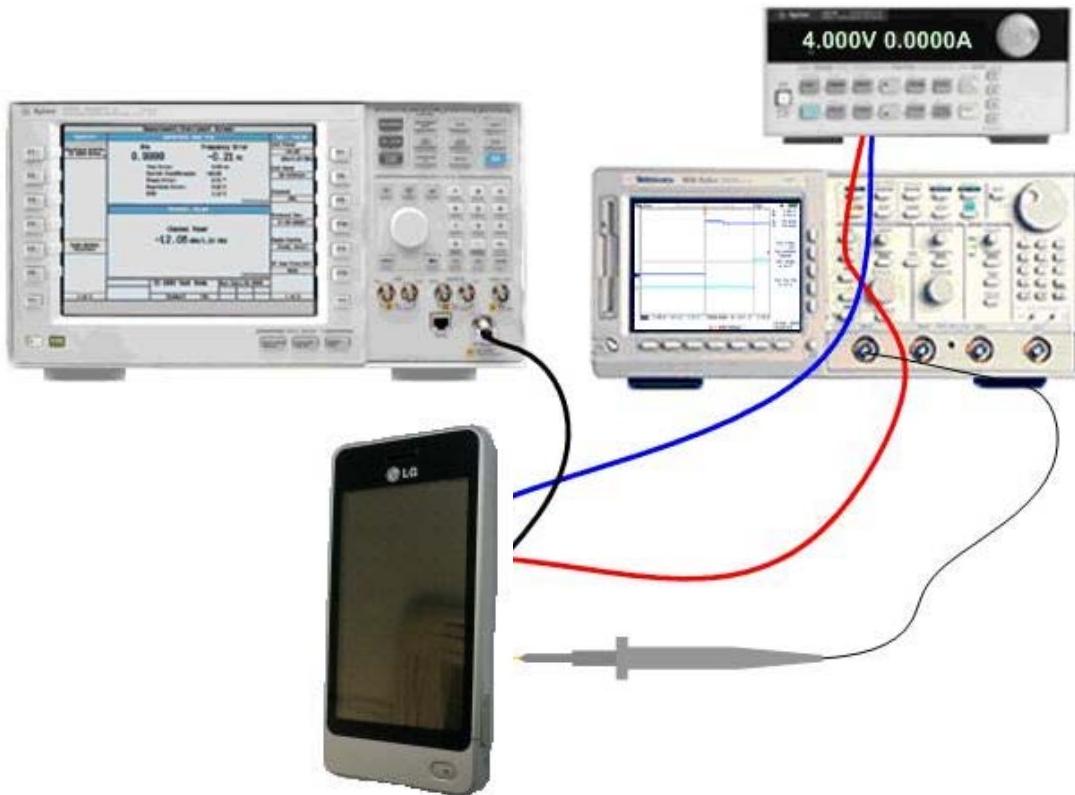
## 4. PCB layout picture



Reference	Description	Reference	Description
MIC201	MIC(SPU0410HR5H-PB)	U200	5pin u USB control IC (MIUIC)
X101	32.768KHz X-tal(FC-135)	U101	PMB8877(DSP/Baseband IC)
U202	Audio Amp(MAX9877AEWP+TG45)	U201	Memory(K522H1HACB-B060)
U305	PMIC(PMB6821)	U403	Touch IC
U304	3xis Accelerometer	CN502	44Pin FPCB Connector

### 5. Trouble shooting

#### 5.1 Trouble shooting test setup



#### Equipment setup

##### Power on all of test equipment

- Connect PIF-UNION JIG or dummy battery to the DUT for power up.
- Connect mobile switch cable between Communication test set and DUT when you need to make a phone call.
- Follow trouble shooting procedure

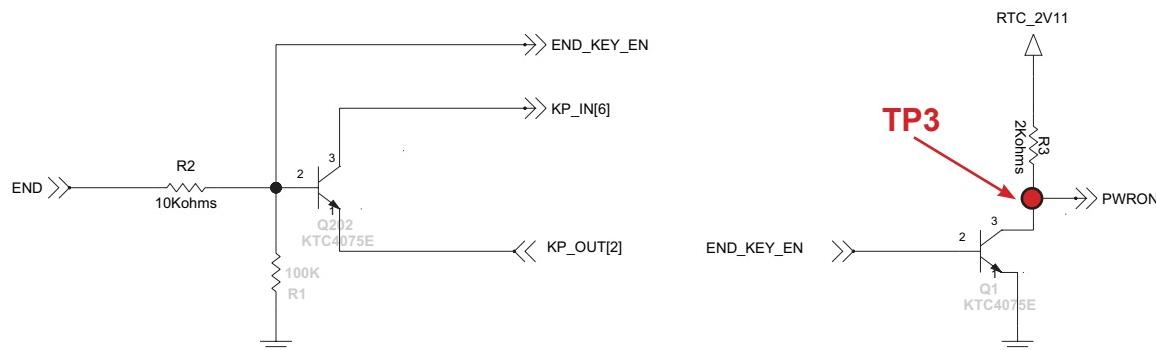
## 5. Trouble shooting

### 5.2 Power on Trouble

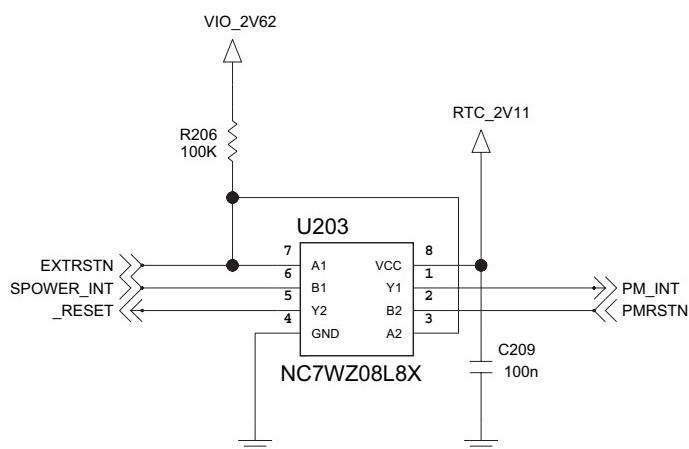
#### Check Points

- Battery Voltage (Need to over 3.35V)
- Power-On Key detection (PWRON signal)
- Outputs of LDOs from PMIC

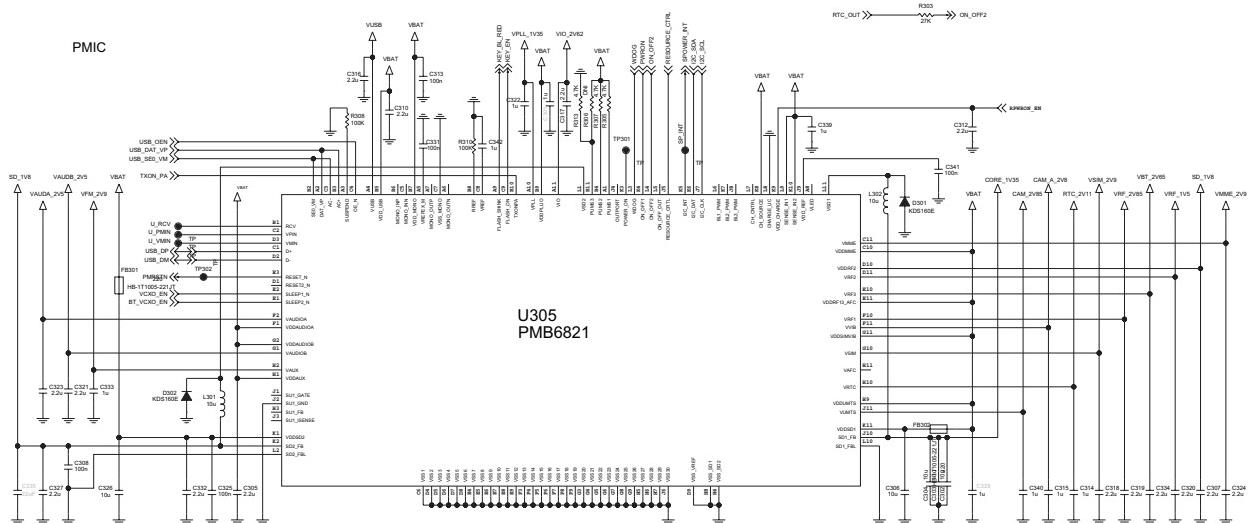
#### Power On



#### External Reset

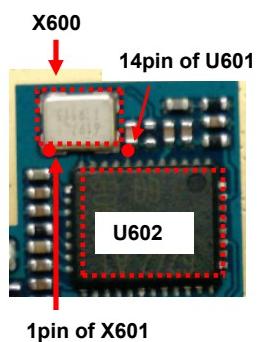
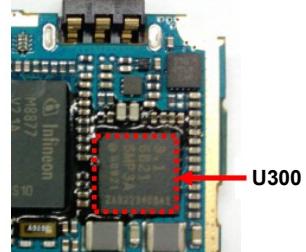
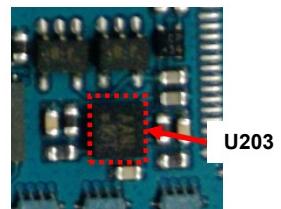
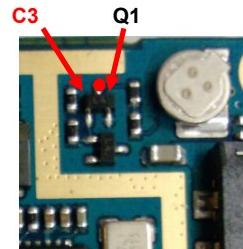
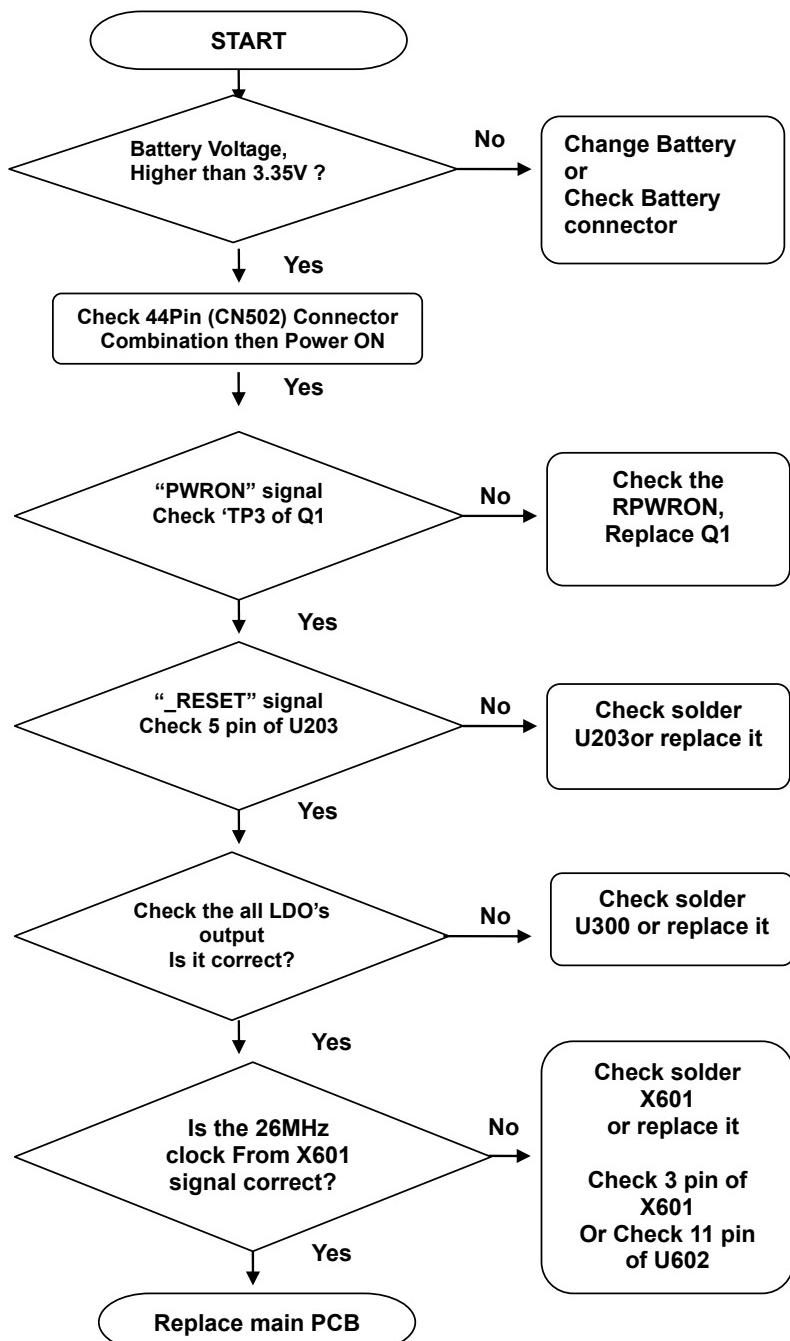


## 5. Trouble shooting



LDO	Net name	Output Voltage	Output Current	Usage
SD1	CORE_1V35	1.35V	600mA	Core & for LDO
SD2	SD_1V8	1.8V	300mA	Memory
VAUX	VFM_2V9	2.9V	100mA	Touch, LCD
VIO	VIO_2V62	2.62V	100mA	Peripherals
VSIM	VSIM_2V9	2.9V	70mA	SIM card
VMME	VMME_2V9	2.9V	150mA	u-SD
VUMTS	CAM_2V85	2.85V	110mA	Camera
VUSB	VUSB	3.1V	40mA	USB
VLED	VLED	2.9V	10mA	Not used
VAUDIOa	VAUDA_2V5	2.5V	200mA	Stereo headset, Mono earpiece
VAUDIOb	VAUDB_2V5	2.5V	50mA	Analog parts of S-Gold
VRF1	VRF_2V85	2.85V	150mA	2.85 V supply for SMARTi-PM RF transceiver
VRF2	VRF_1V5	1.53V	100mA	1.5 V supply for SMARTi-PM RF transceiver
VRF3	VBT_2V65	2.7V	150mA	BT/FM Radio
VPLL	VPLL_1V35	1.35V	30mA	S-GOLD3 PLL
VRTC	VRTC_2V11	2.11V	4mA	Real Time Clock
VAFC	VAFC	2.65V	5mA	Not used
VVIB	CAM_A_2V8	2.8V	140mA	Camera

## 5. Trouble shooting

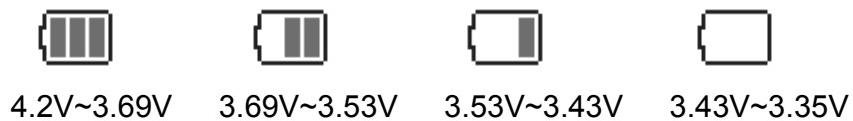


### 5.3 Charging trouble

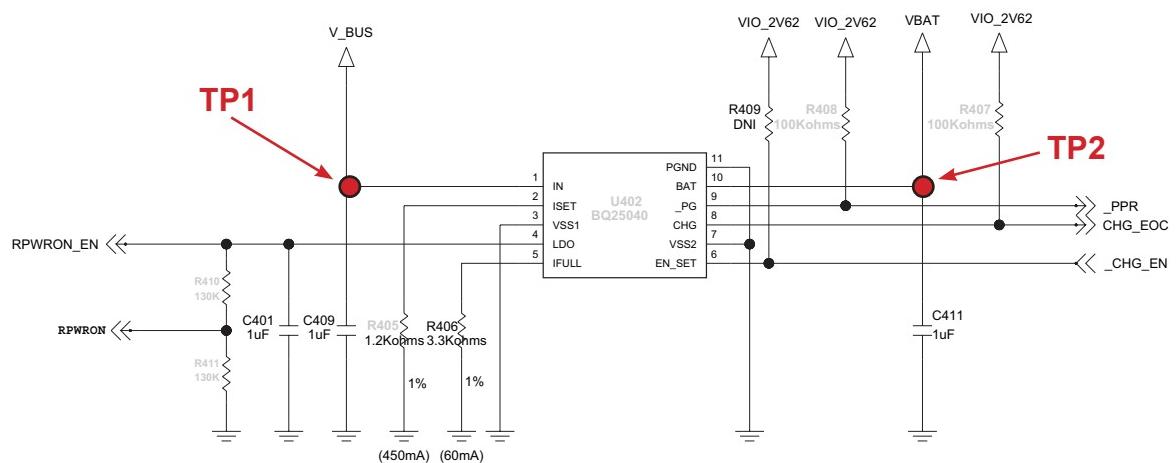
#### Check Points

- Connection of TA (check TA voltage 4.8V)
- Charging Current Path component voltage drop
- Battery voltage

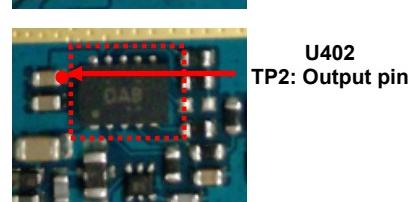
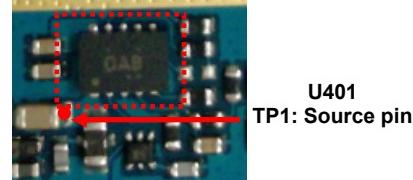
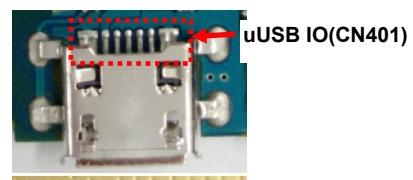
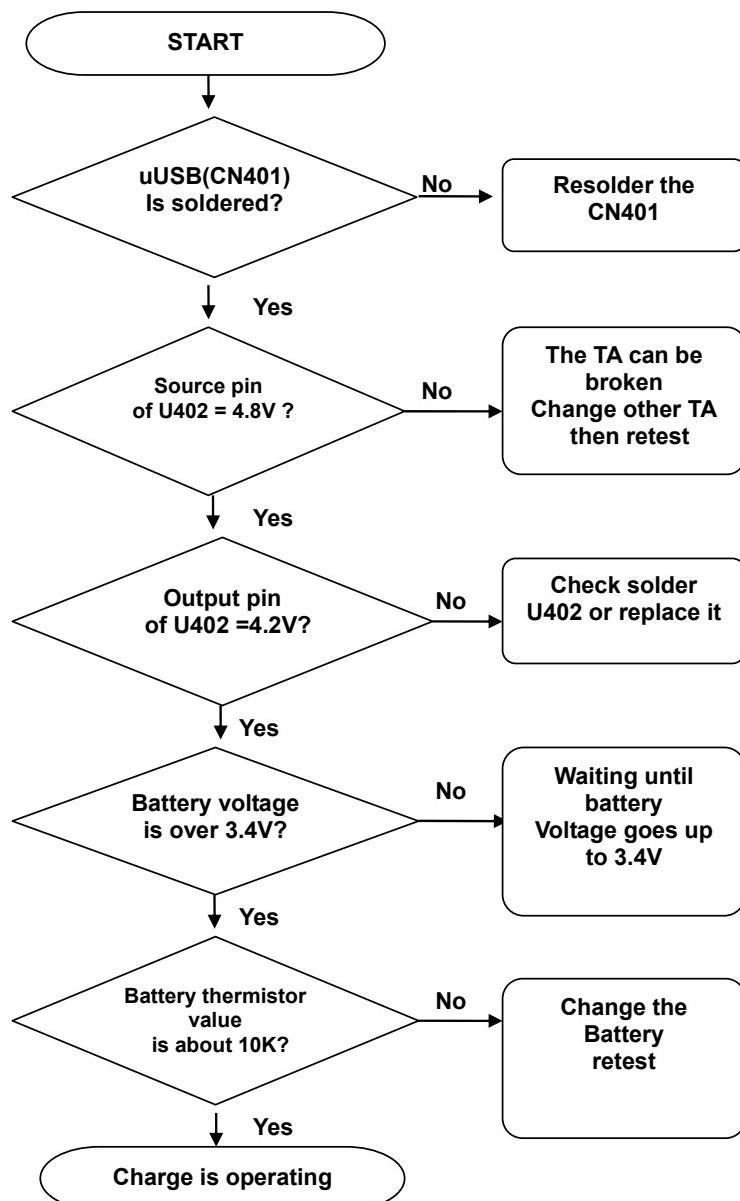
- 1 Charging method : CC-CV
- 2 Charger detect voltage : 4.0 V
- 3 Charging time : 2h 10m
- 4 Charging current : 525 mA
- 5 CV voltage : 4.2 V
- 6 Cutoff current : 75 mA
- 7 Full charge indication current (icon stop current) : 75 mA
- 8 Recharge voltage : 4.16 V



Single Charging IC for uUSB



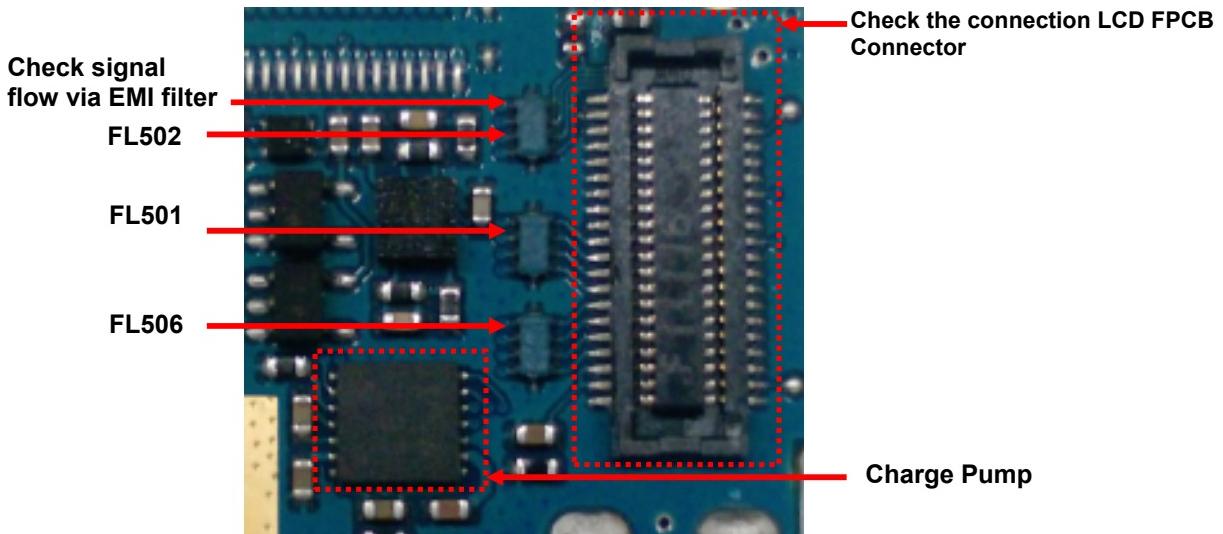
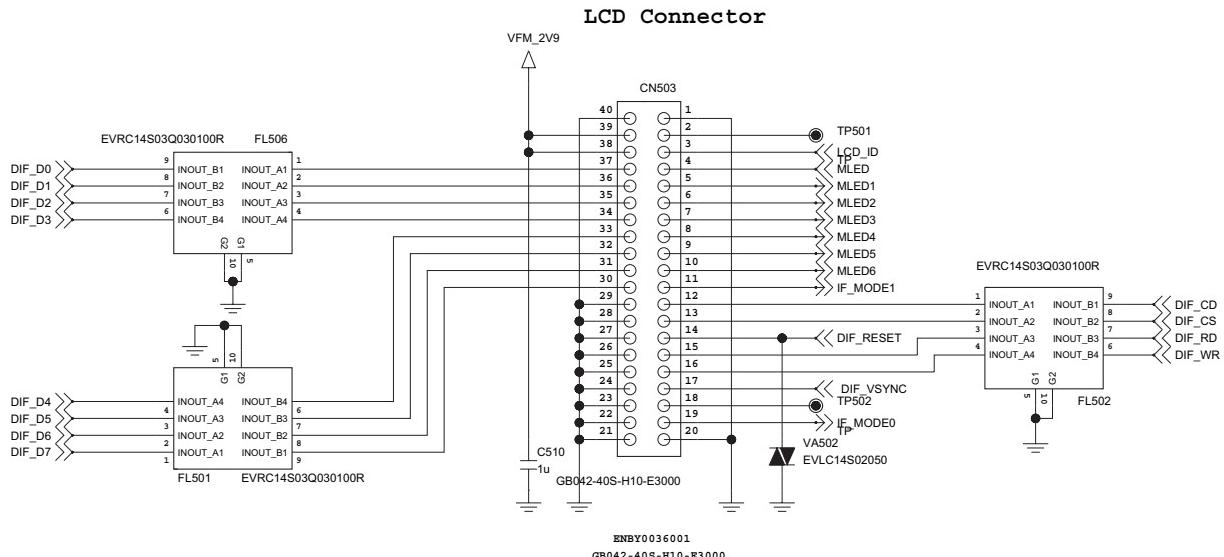
## 5. Trouble shooting



### 5.4 LCD display trouble

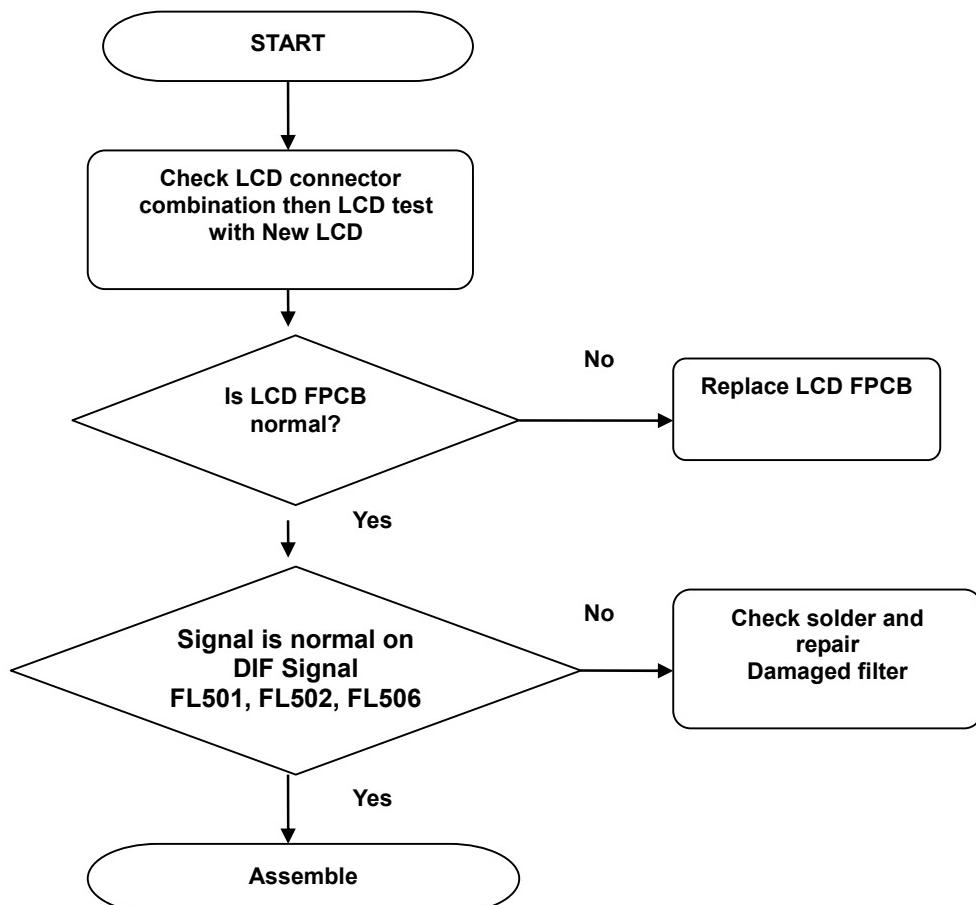
#### Check Points

- LCD assembly status ( LCD FPCB, Connector on FPCB)
- EMI filter soldering
- Connector combination



## 5. Trouble shooting

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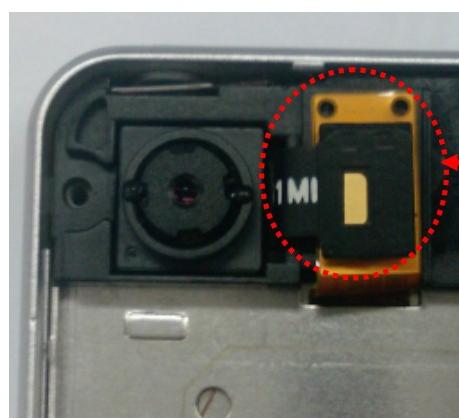
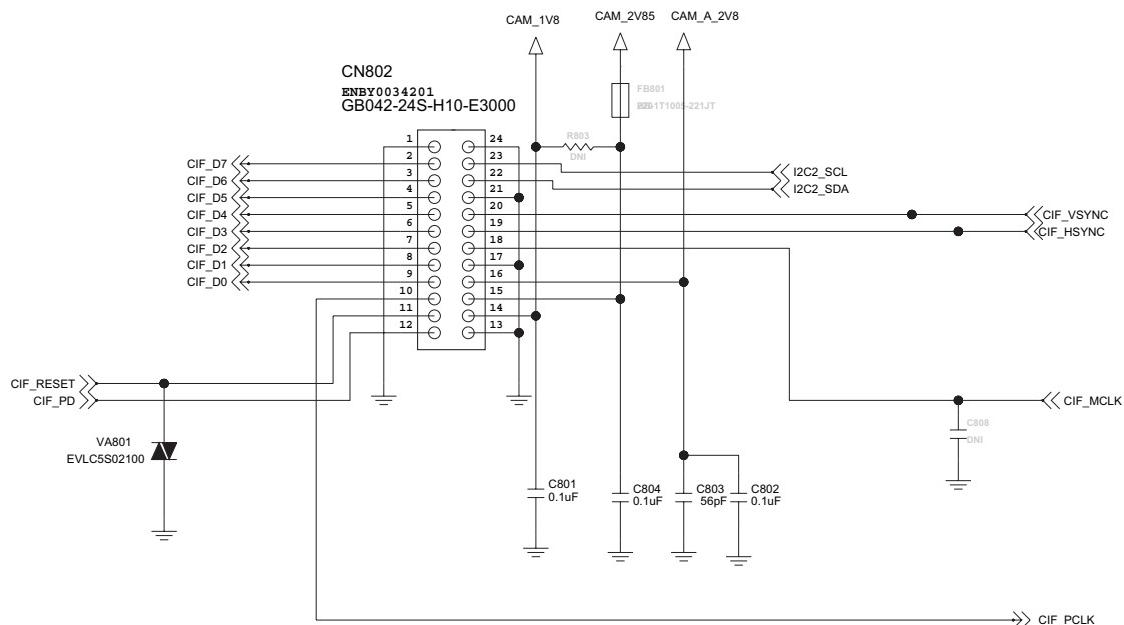


### 5.5 Camera Trouble

#### Check Points

- Connectors combination
- FPCB status

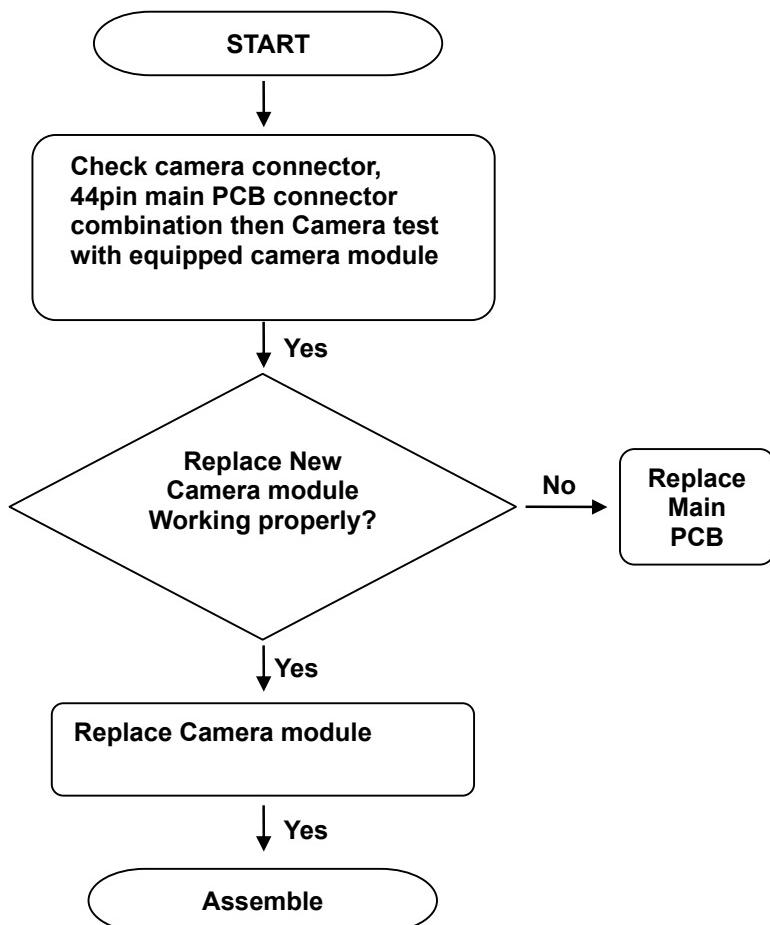
### 3M F/F Camera Connector



Check the connector combination

## 5. Trouble shooting

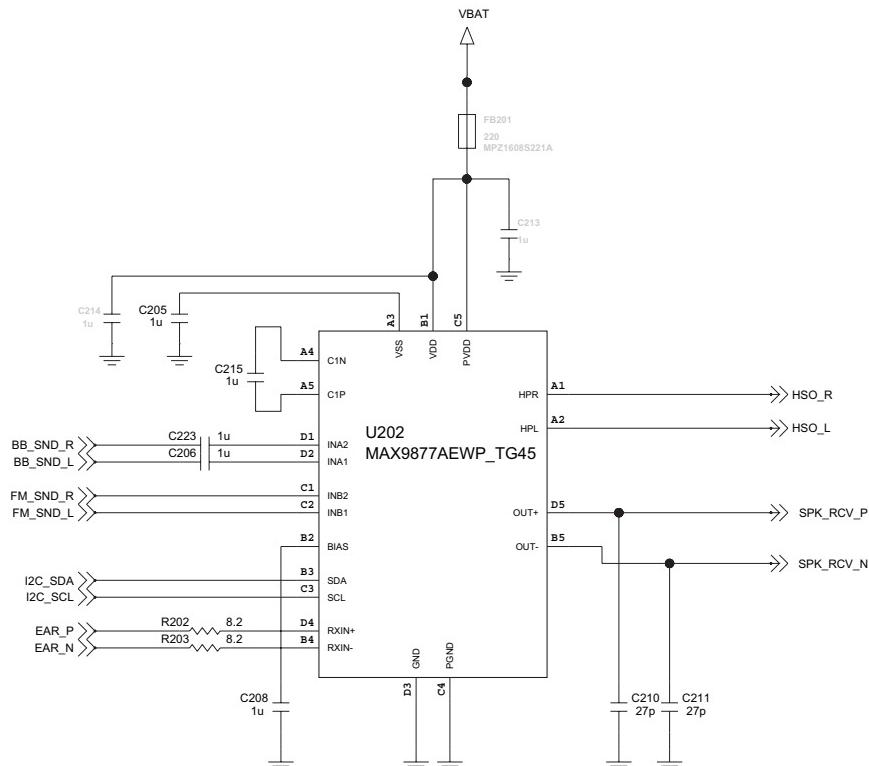
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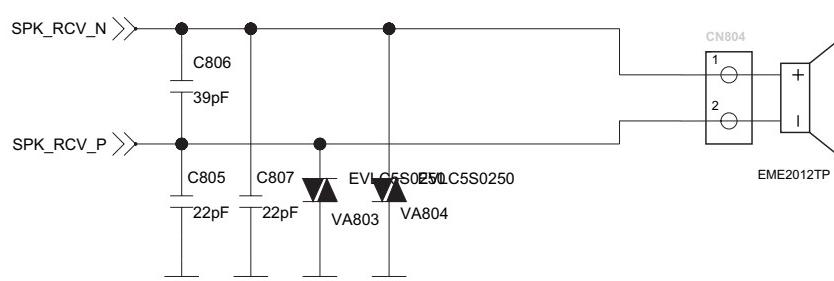
### 5.6 Receiver & Speaker trouble

#### Check Points

- Speaker contact
- Audio amp soldering

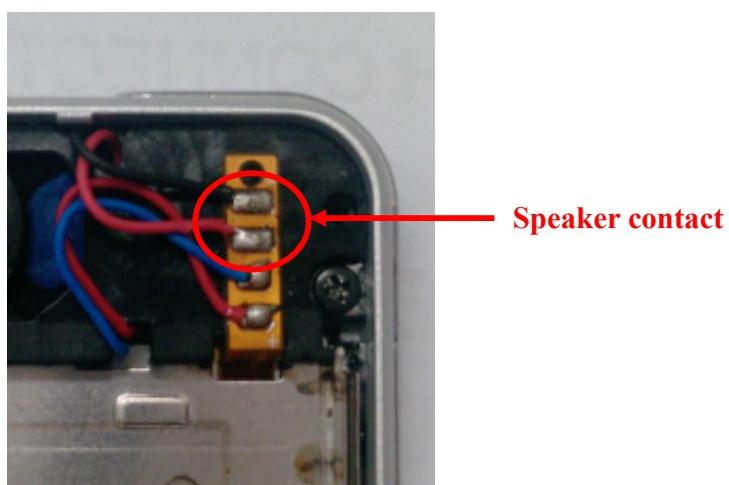
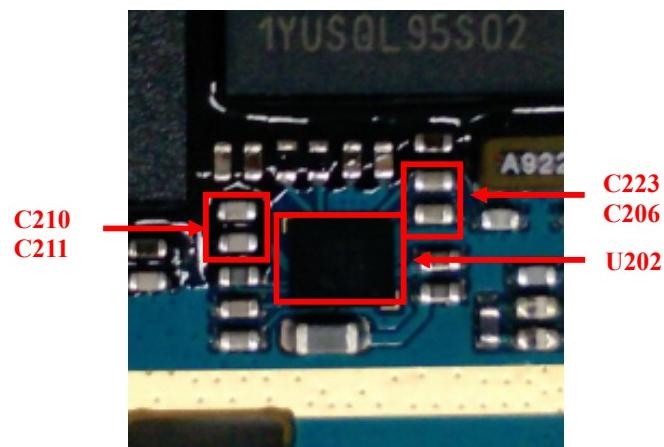


### Receiver & Speaker



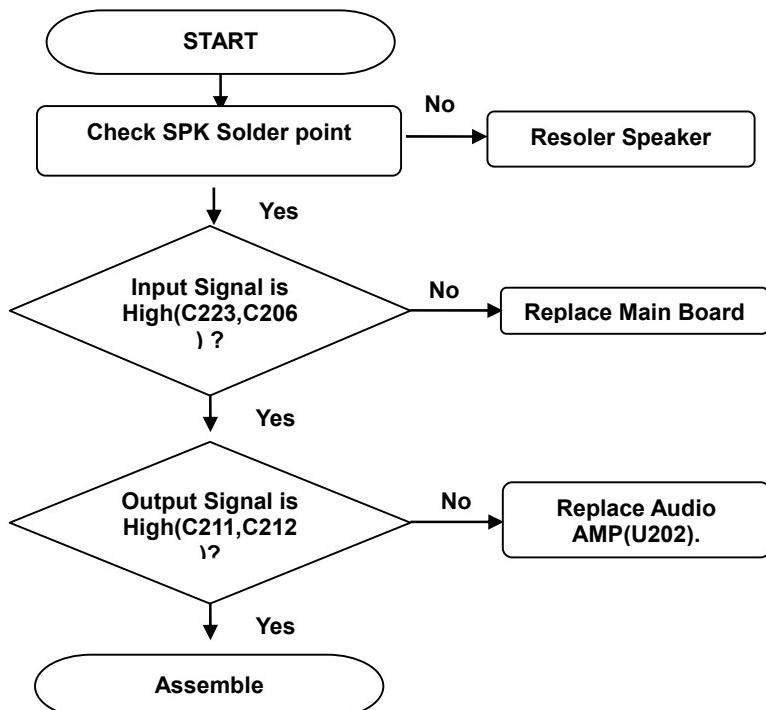
## 5. Trouble shooting

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## 5. Trouble shooting

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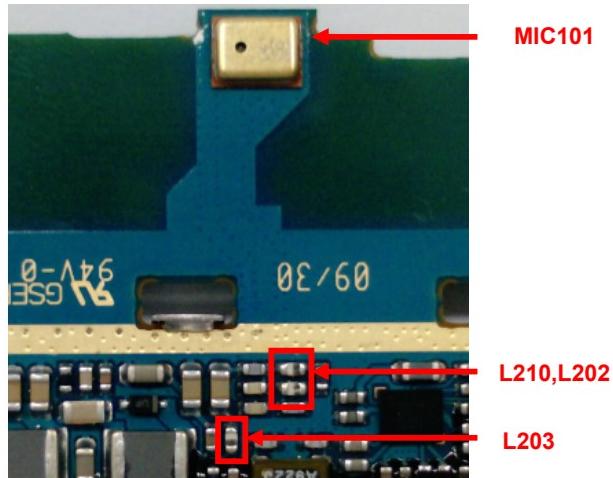
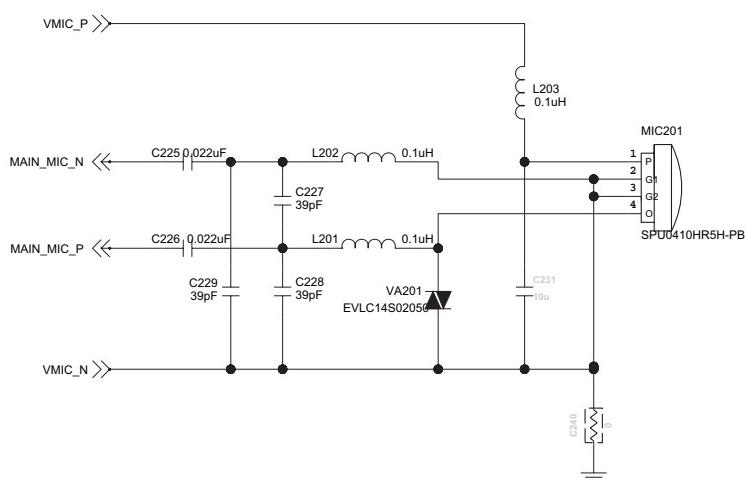
## 5. Trouble shooting

### 5.7 Microphone trouble

#### Check Points

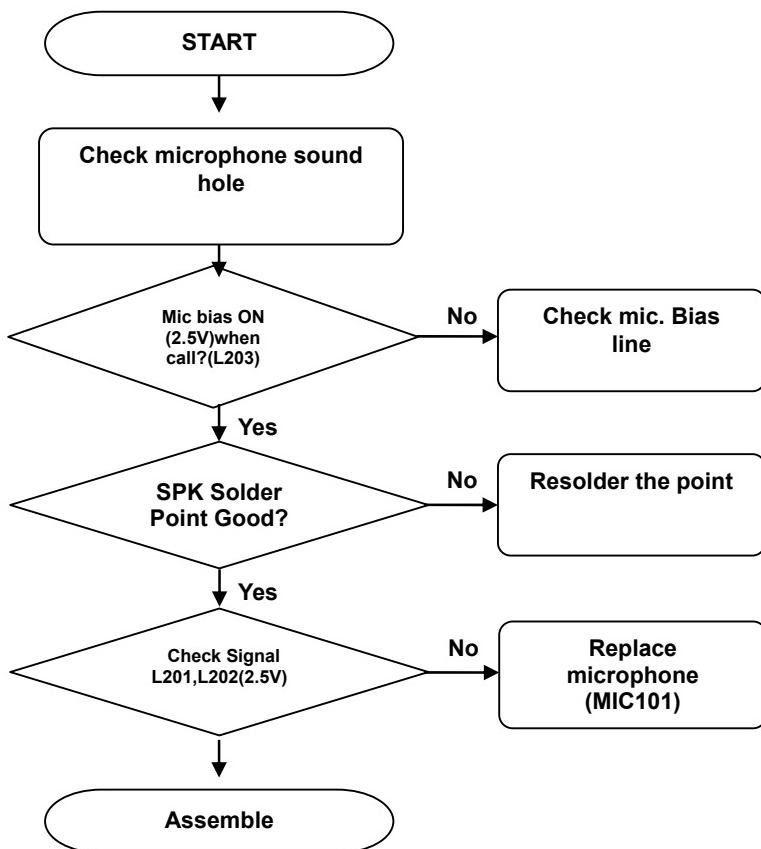
- Microphone hole
- Mic. Bias & signal line

MIC



## 5. Trouble shooting

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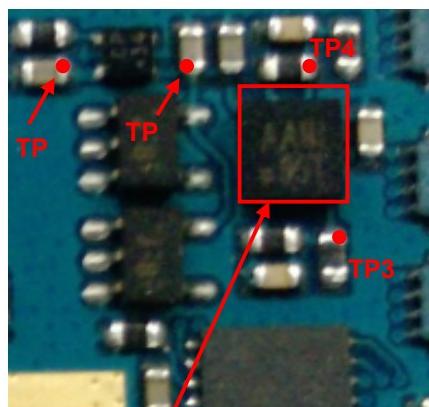
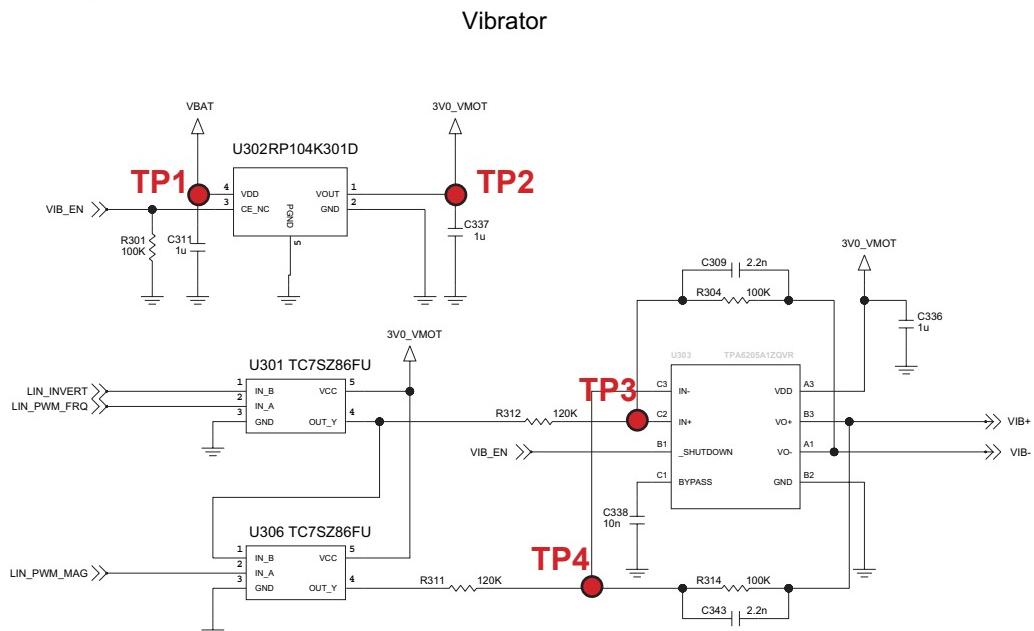


## 5. Trouble shooting

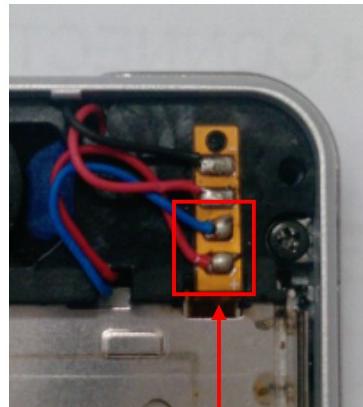
### 5.8 Vibrator trouble

#### Check Points

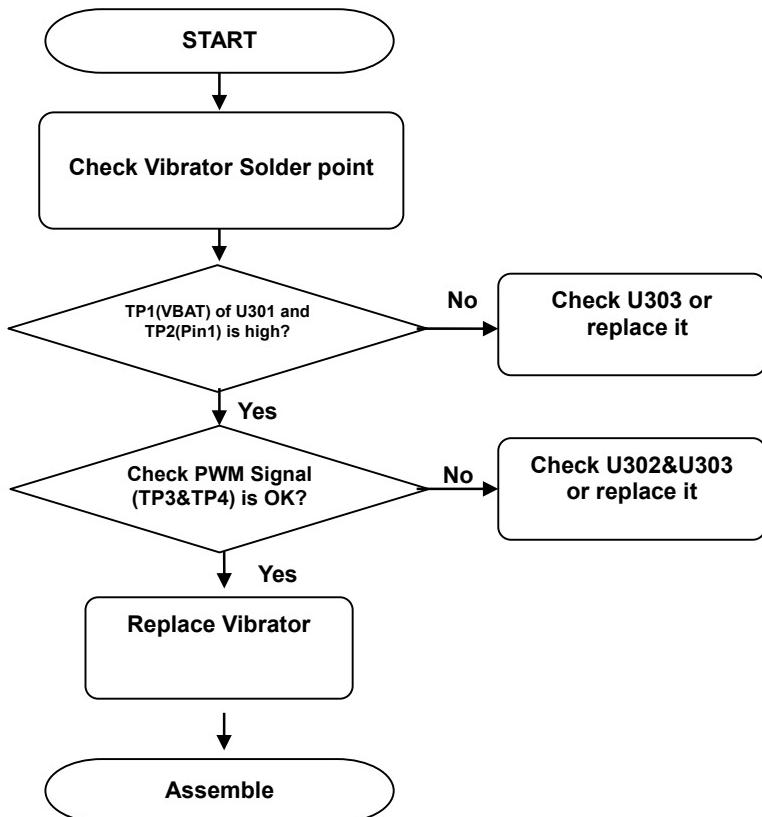
- Vibrator soldering
- IC is working correct



Check the driver  
IC(U303)  
PWM Signal



Check the vibrator  
contact

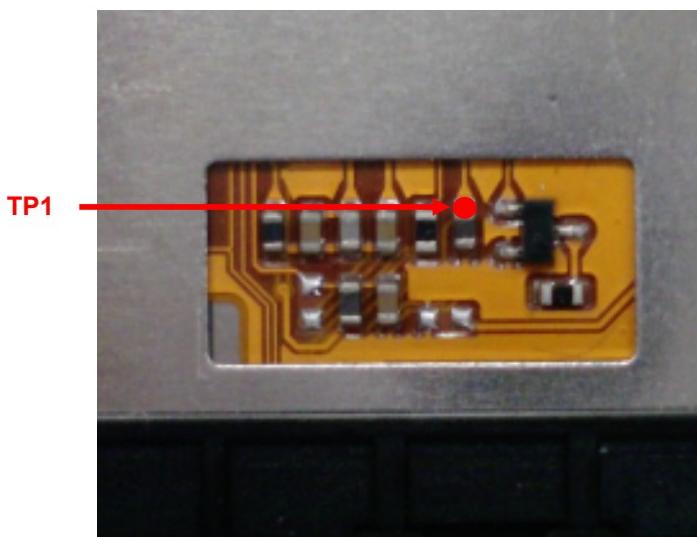
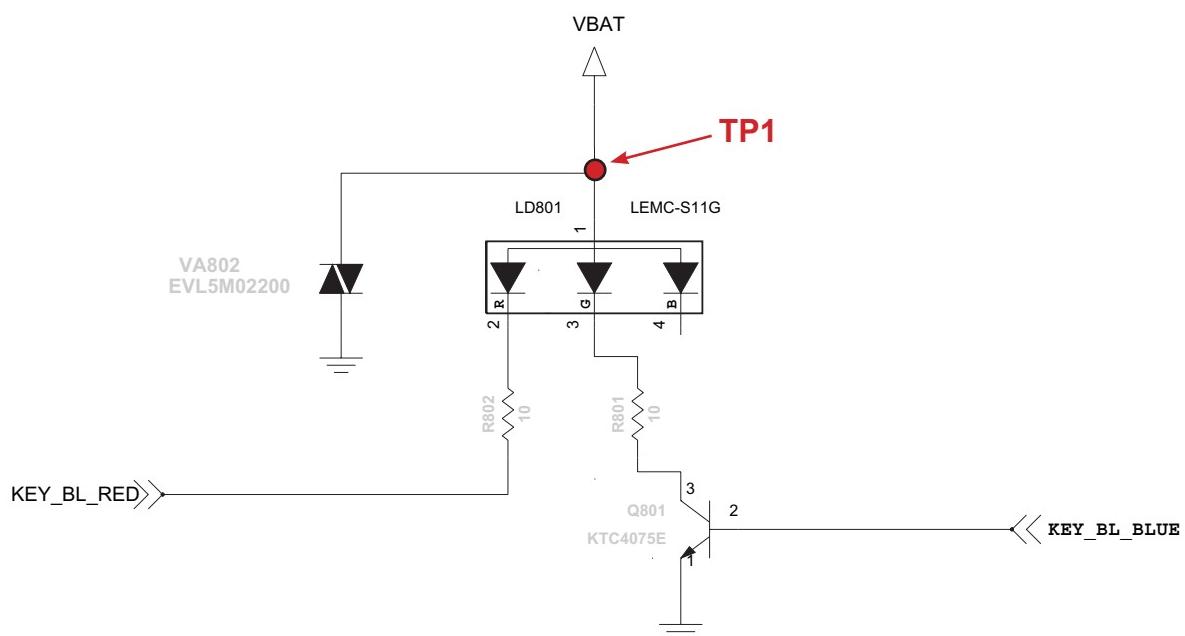


## 5. Trouble shooting

### 5.9 Keypad back light trouble

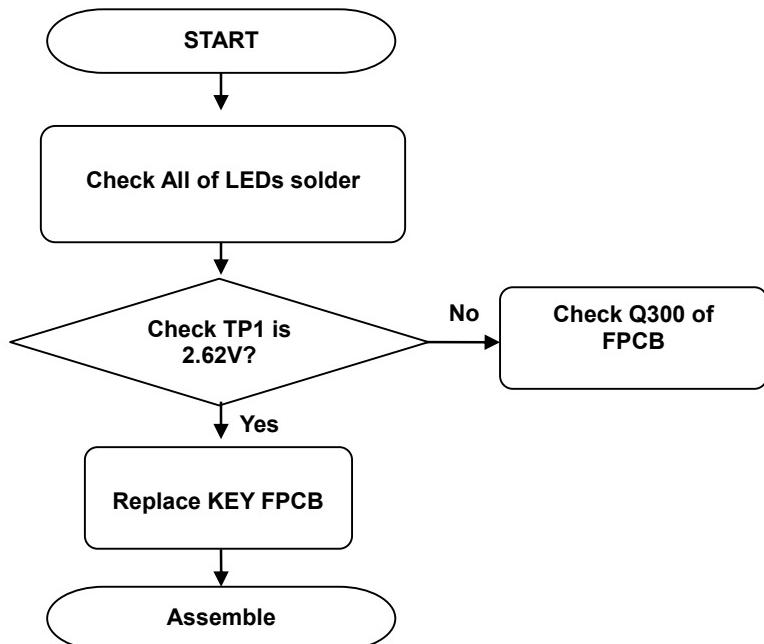
#### Check Points

- Signal path is connected well



## 5. Trouble shooting

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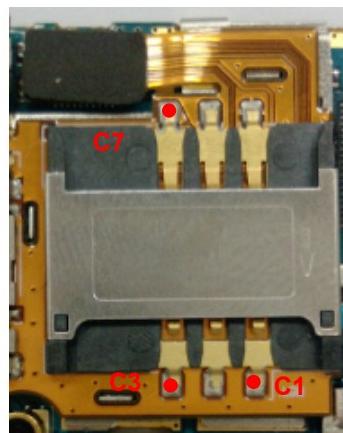
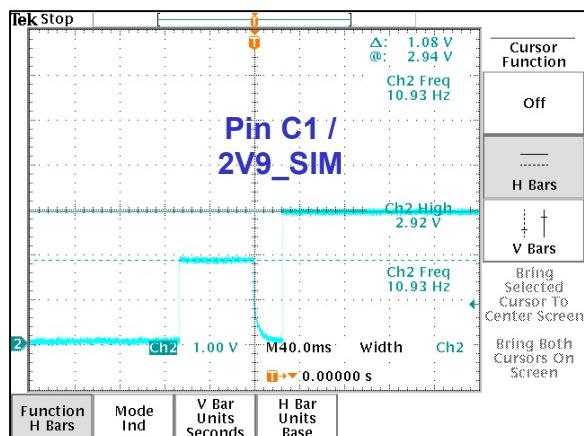


## 5. Trouble shooting

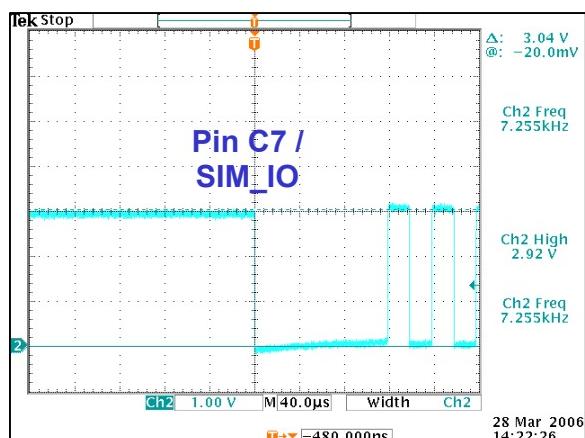
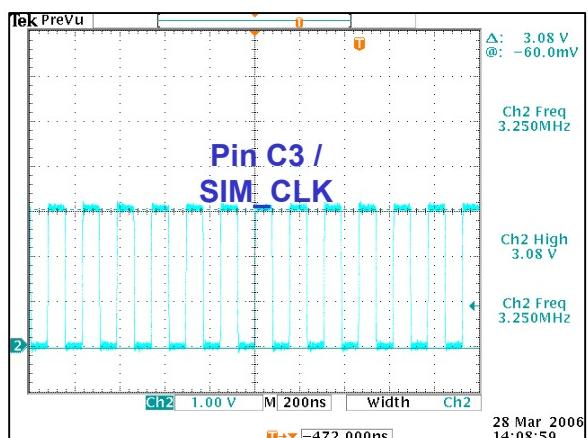
### 5.10 SIM & uSD trouble

#### SIM Check Points

- Power is working
- Socket soldering
- Proper SIM is used

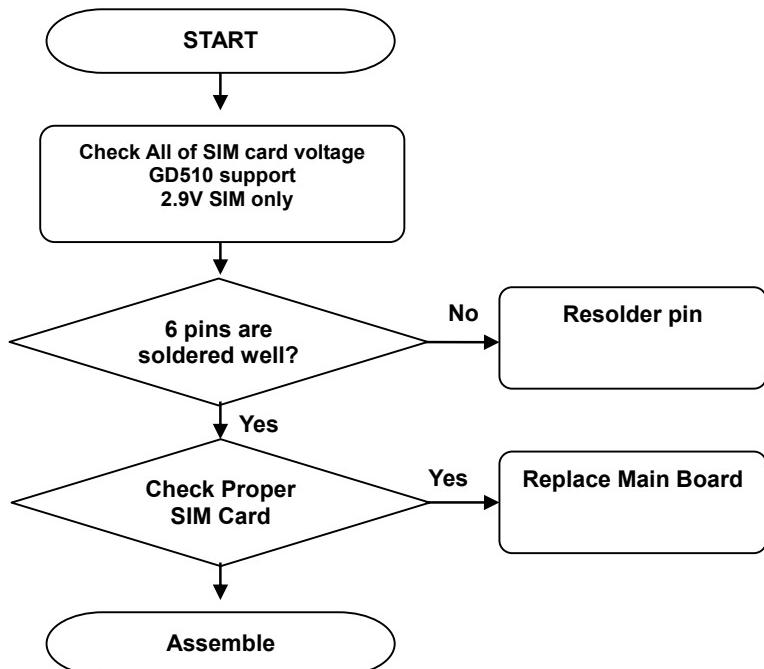


Check  
soldering  
all pin of  
socket



## 5. Trouble shooting

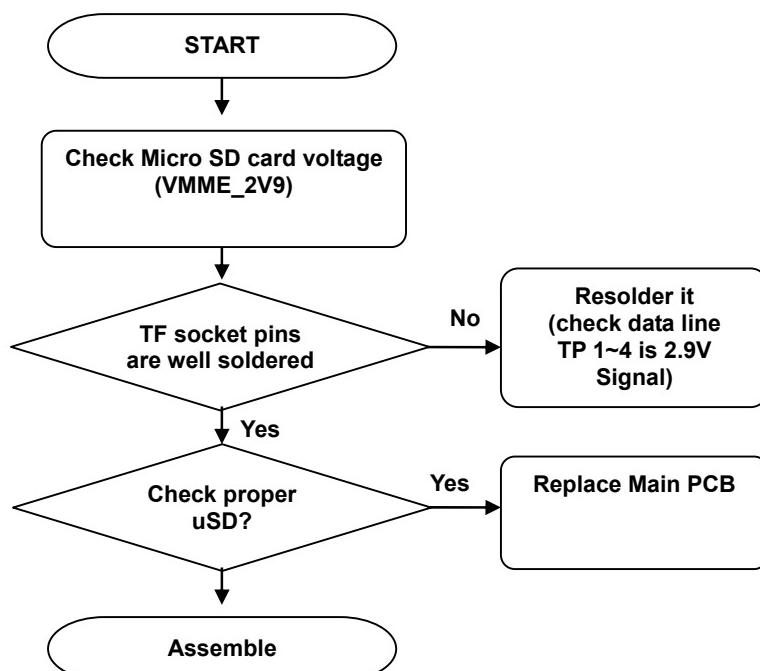
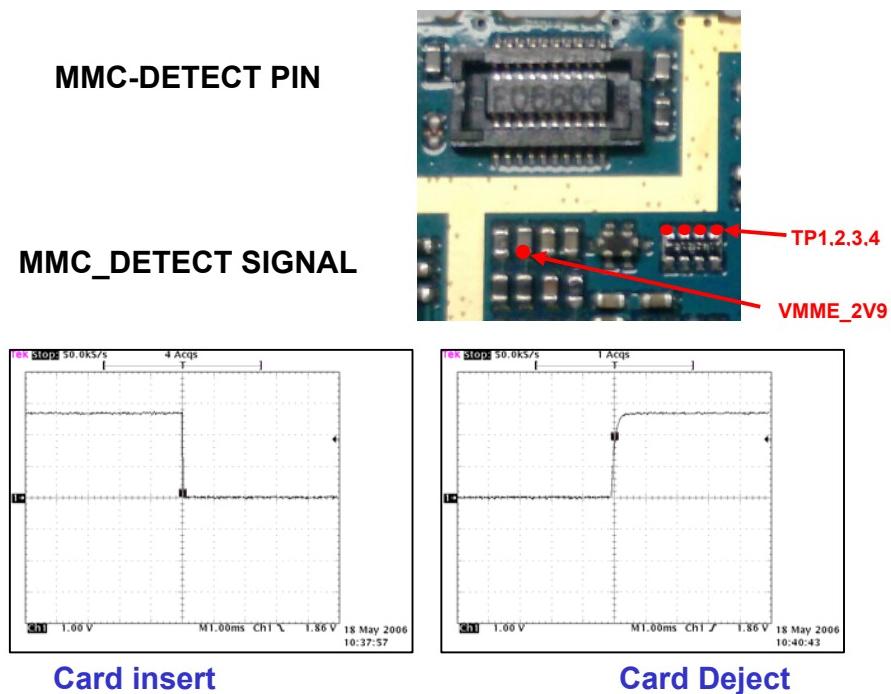
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### uSD Check Points

- Power is working
- Socket soldering
- Card detect is working

## 5. Trouble shooting

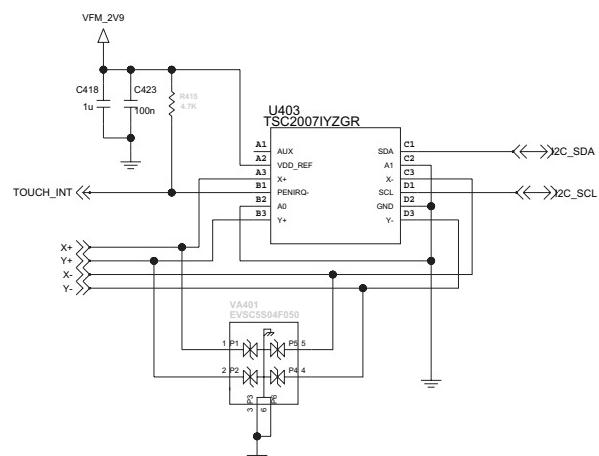


### 5.11 Touch trouble

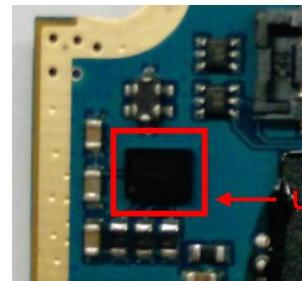
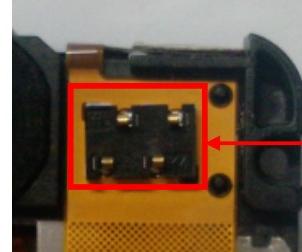
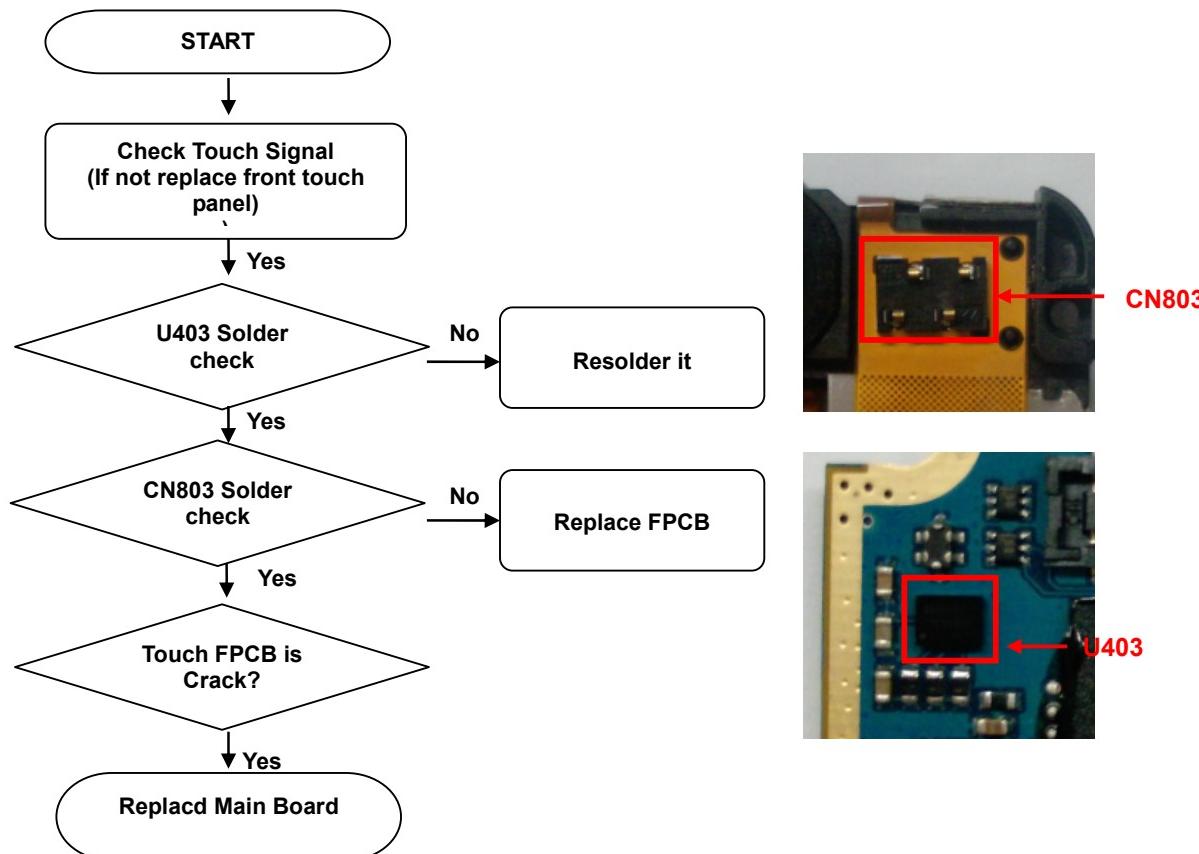
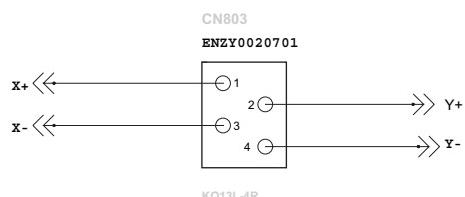
#### Check Points

- Touch driver IC soldering`
- FPCB\_Folder Crack

Touch IC

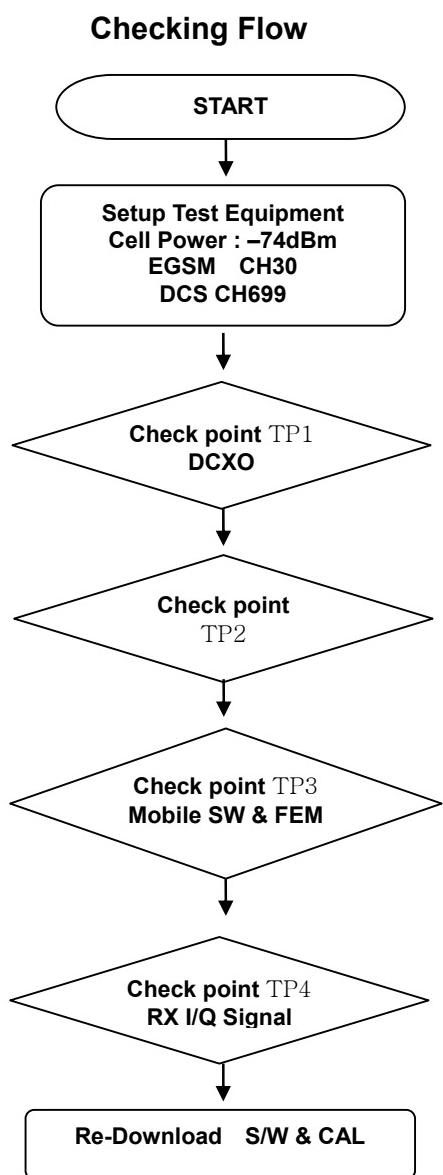


### TOUCH CONNECTOR



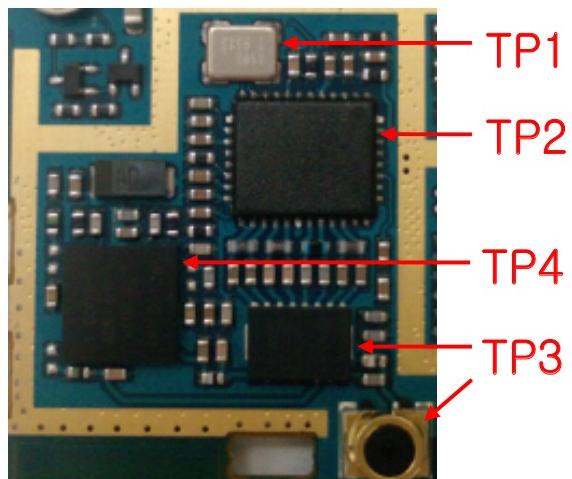
## 5. Trouble shooting

### 5.12 Trouble shooting of Receiver part



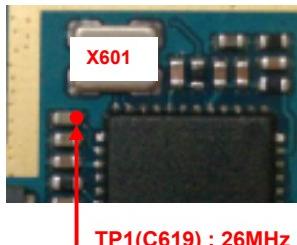
**Checking Points**

**Figure 1. Main PCB**



### 5.12.1. Checking DCXO Circuit

#### Checking Points



#### Checking Flow

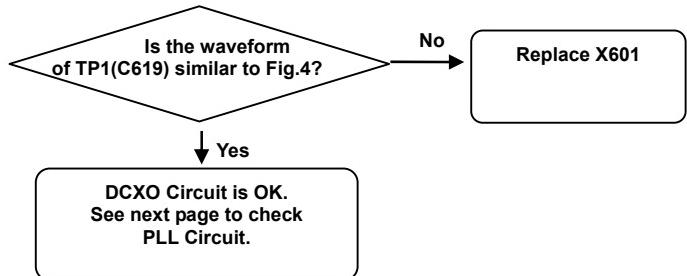


Figure2. DCXO

#### DCXO Circuit Diagram

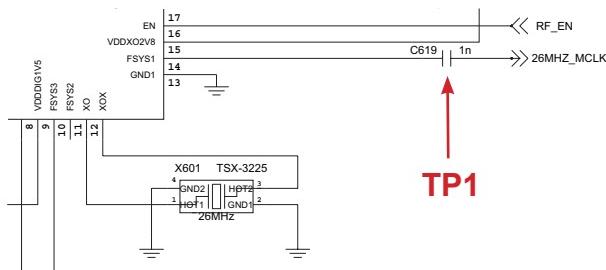


Figure 3. DCXO Circuit

#### Waveform

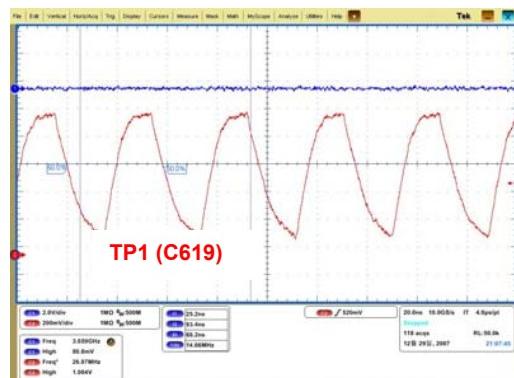


Figure 4. DCXO Waveform

## 5. Trouble shooting

### 5.12.2. Checking PLL Control signals

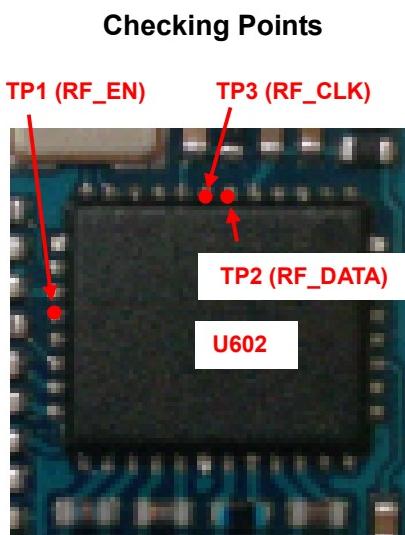
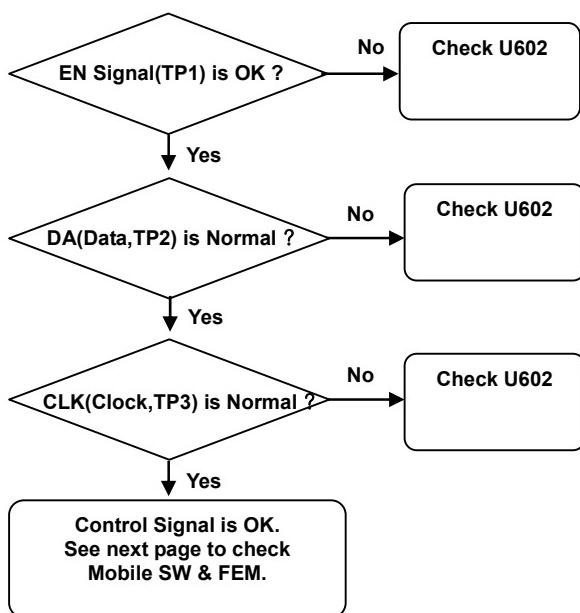


Figure 5. Transceiver

#### Checking Flow



#### RF Transceiver Circuit Diagram

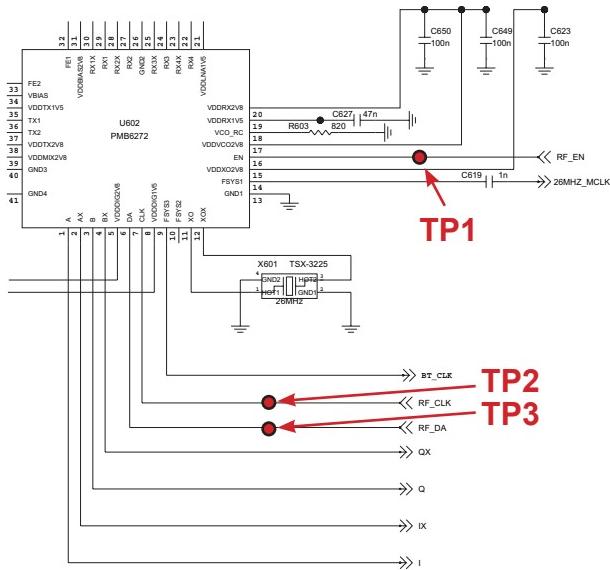


Figure 6. Transceiver Circuit

#### Waveform

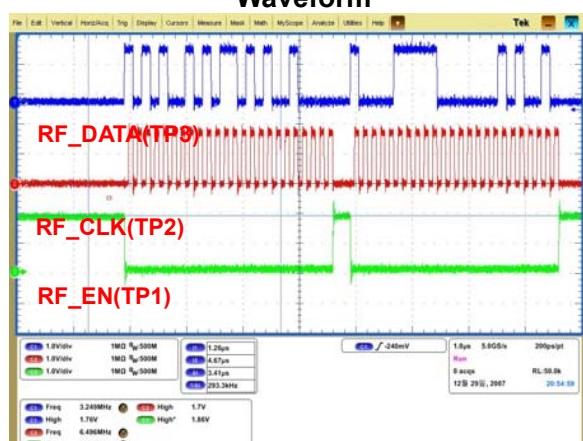


Figure 7. PLL Control Waveform

## 5. Trouble shooting

### 5.12.3 Checking Mobile SW & FEM

Mobile SW & FEM Circuit Diagram

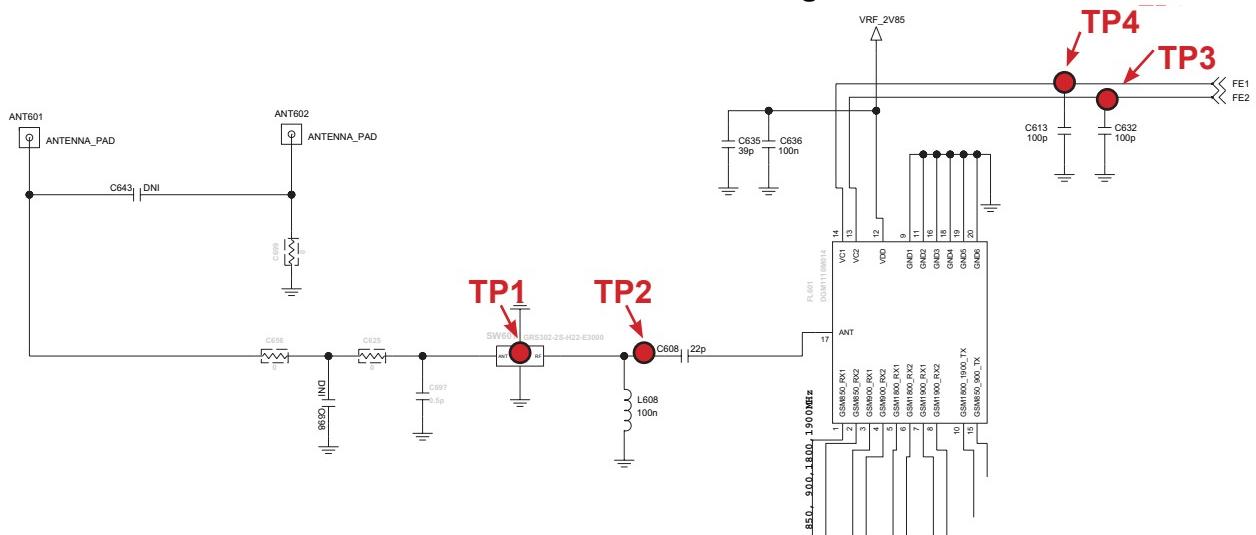


Figure 8. Mobile SW & FEM Circuit

### Checking Points

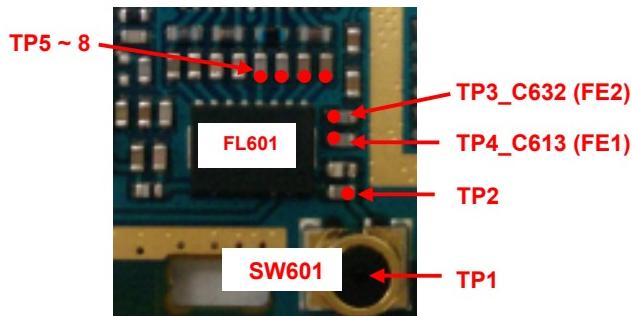
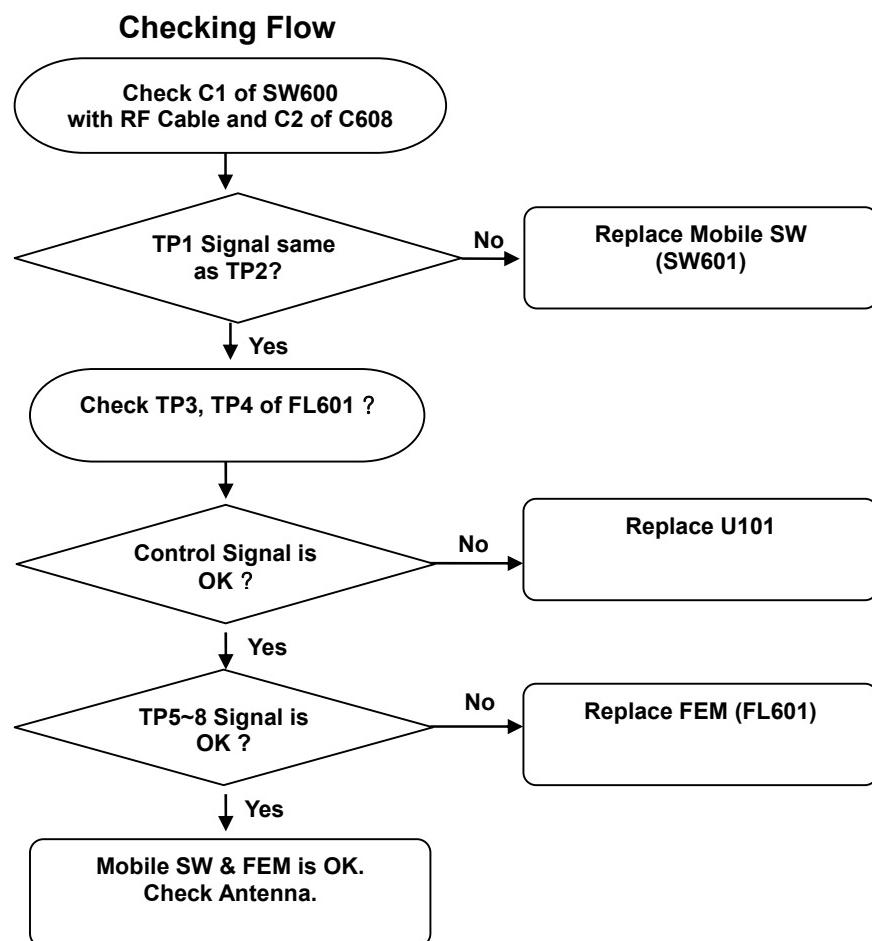


Figure 9. Mobile SW & FEM

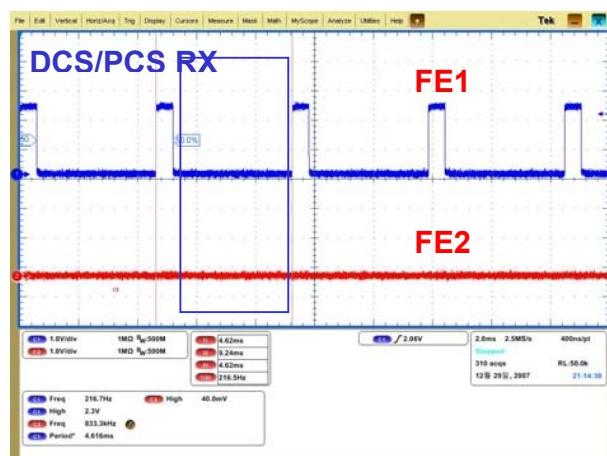
Table 2. FEM RX Control Logic

	EGSM/GSM850	DCS/PCS
FE1	OFF	ON
FE2	OFF	OFF

## **5. Trouble shooting**



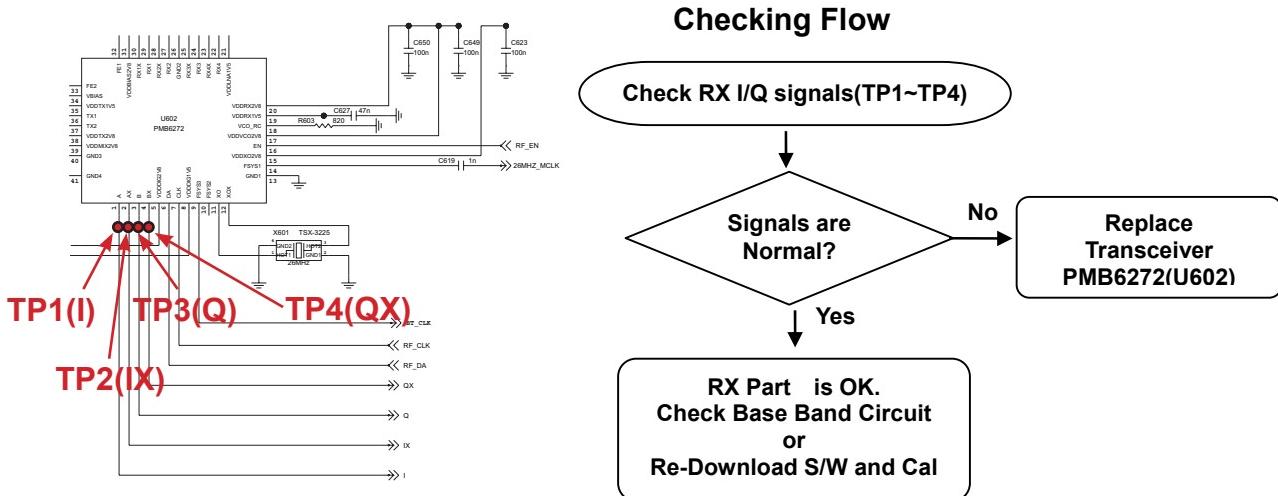
**Figure 10 Mobile SW**



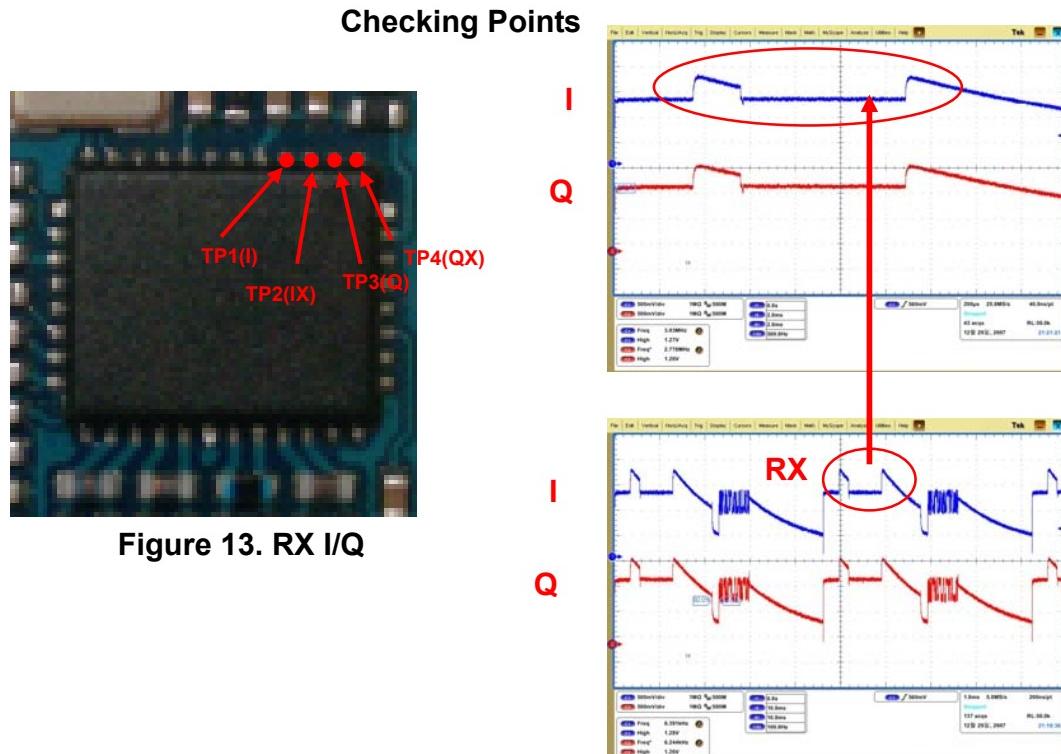
**Figure 11 FEM Control Signals**

## **5. Trouble shooting**

#### 5.12.4. Checking RX I/Q Signals



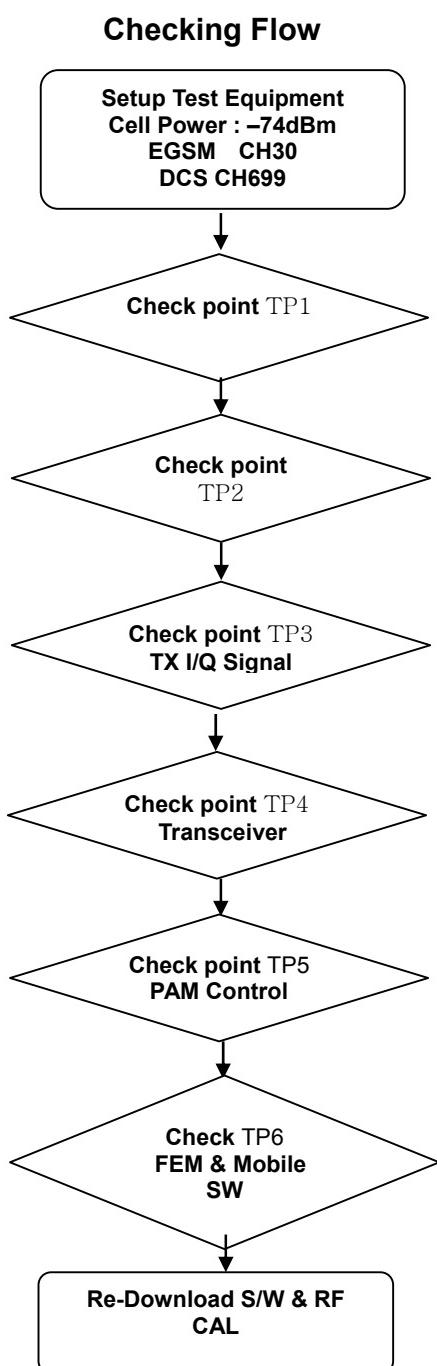
**Figure 12.** RX I/Q Circuit



**Figure 13. RX I/Q**

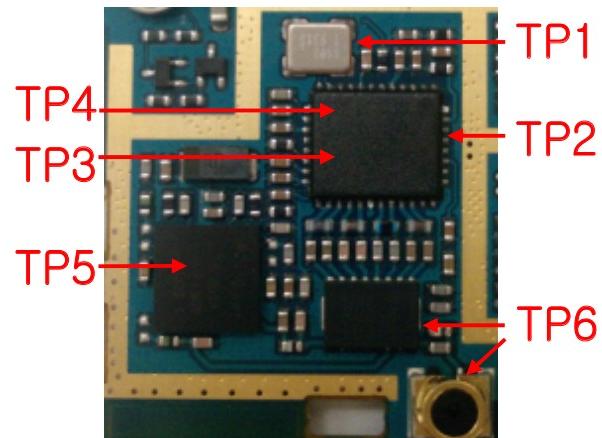
## 5. Trouble shooting

### 5.13 Trouble shooting of Transmitter part.



**Checking Points**

**Figure 15. Main PCB**



**Figure 16. Main PCB**

### **5.13.1. Checking VCTCXO Circuit**

**See RX Part “1. Checking DCXO Circuit”**

### **5.13.2. Checking PLL Control Signal**

**See RX Part “2. Checking PLL Control Signal”**

## 5. Trouble shooting

### 5.13.3. Checking TX I/Q Signals

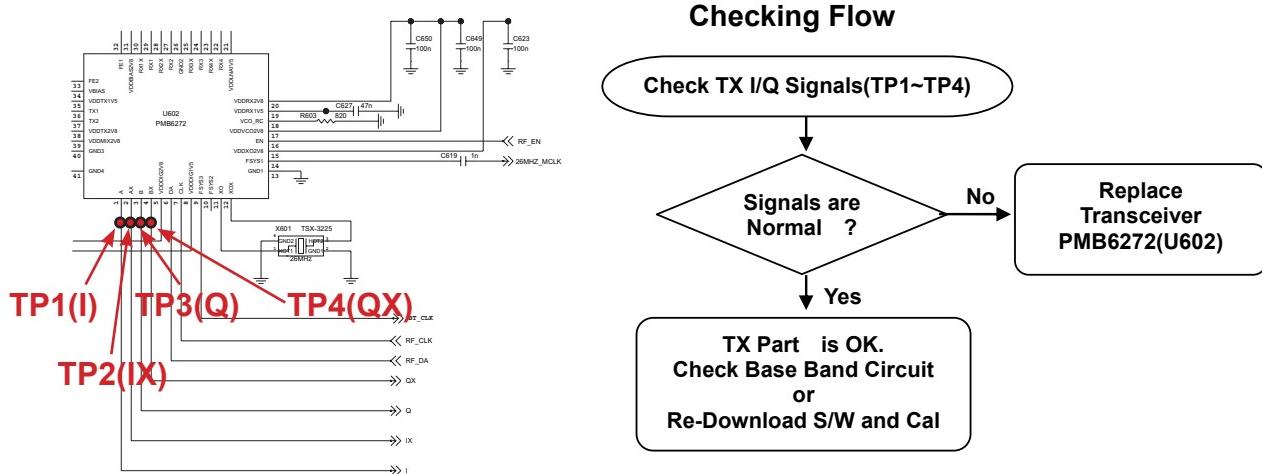


Figure 17. Tx I/Q

### Checking Points

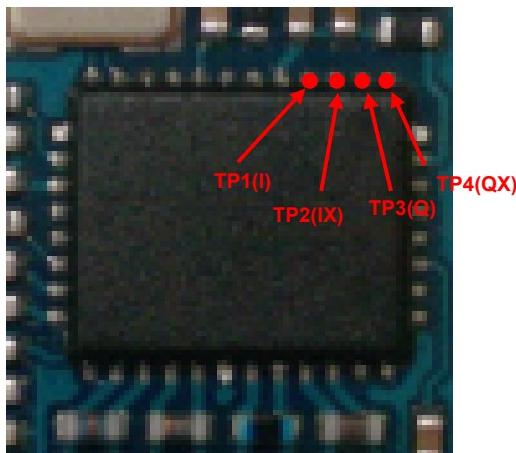
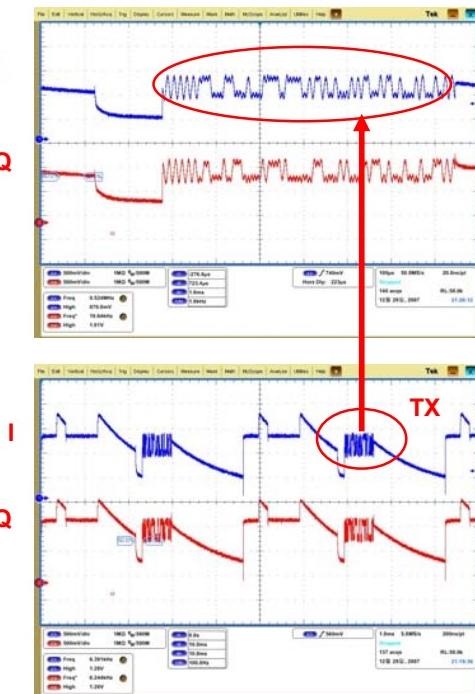


Figure 18. TX I/Q



### 5.13.4. Checking Transceiver Output Signals

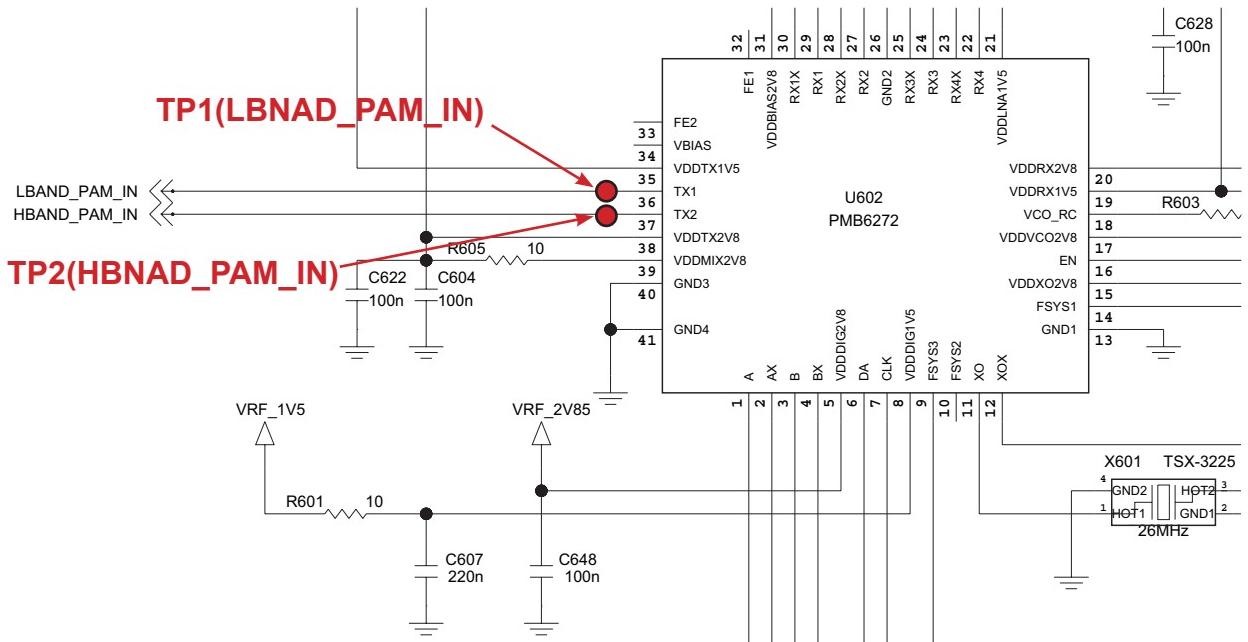


Figure 20. Transceiver Output Circuit

### Checking Points

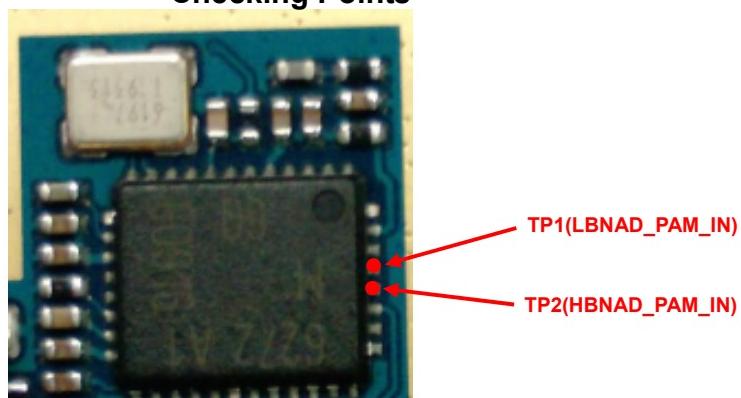
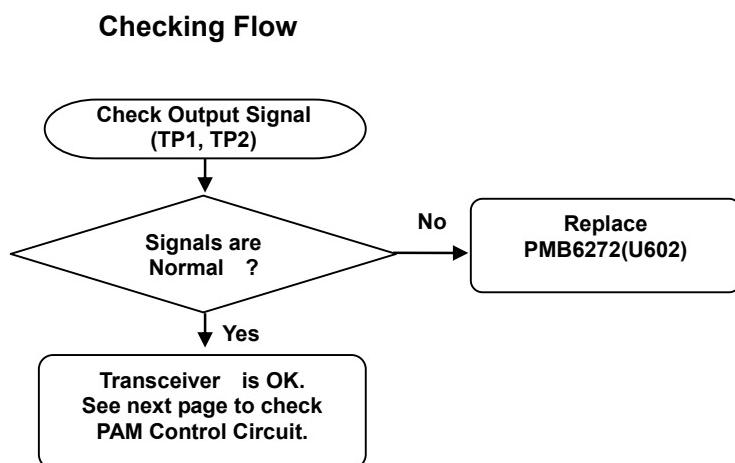


Figure 21. Transceiver Output

Table 3. Transceiver Output Operation

MODE	Transceiver Output
GMSK	Fixed
8PSK	Ramp Burst Control

## 5. Trouble shooting



**LBAND\_PAM\_IN (MODE: GMSK) : TP1**

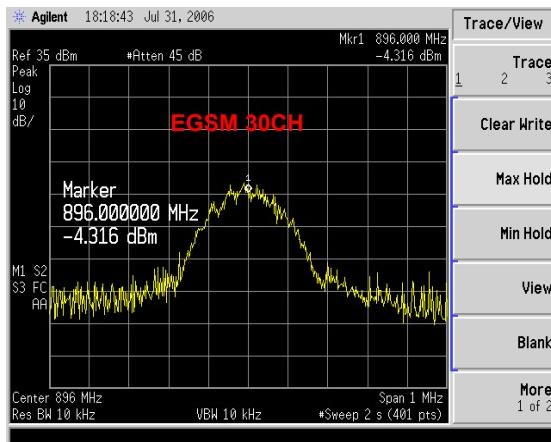


Figure 22. Transceiver Output (GMSK)

**LBAND\_PAM\_IN (MODE: 8PSK) : TP1**

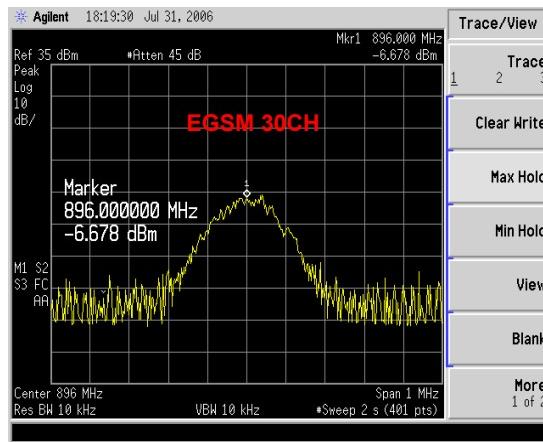


Figure 23. Transceiver Output (8PSK)

### 5.13.5. Checking PAM Control Signals

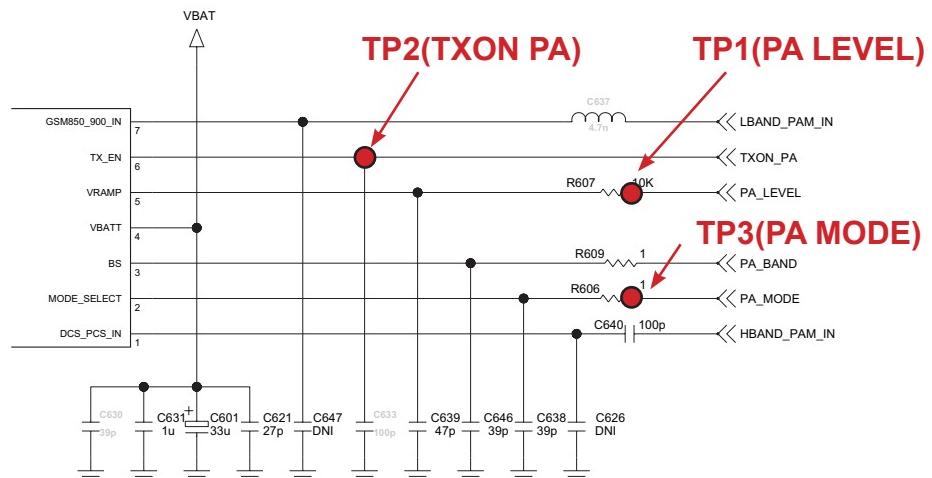


Figure 24. PAM Control Signals

### Checking Points

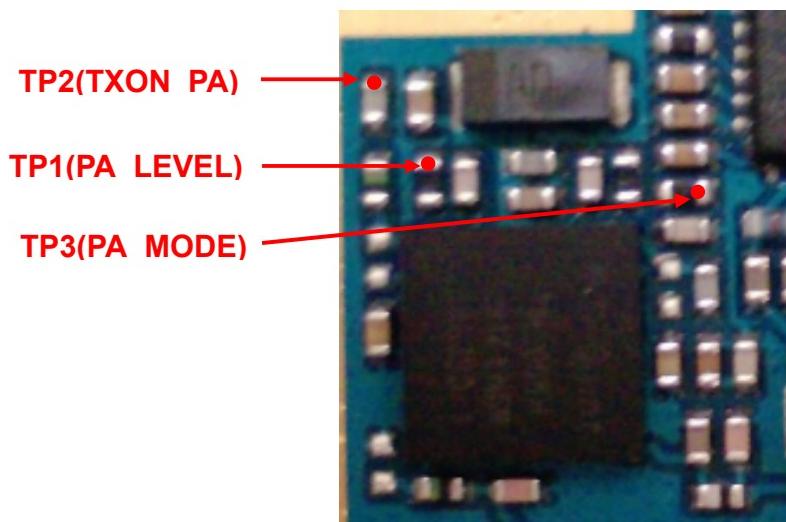


Figure 25. Transceiver Output

Table 4. PAM Mode Operation

MODE	MODE	PA_LEVEL	TXON_PA
GMSK	LOW	Ramp Burst Control	HIGH
8PSK	HIGH	Control Amp bias	HIGH

## 5. Trouble shooting

### Checking Flow

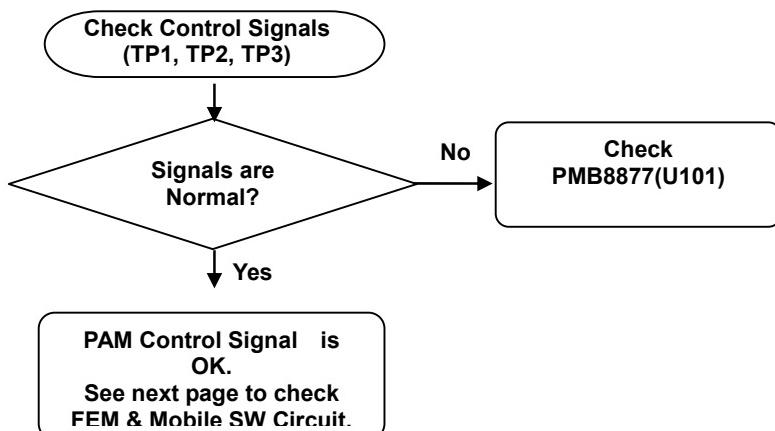


Figure 26. GSMK Control Signal

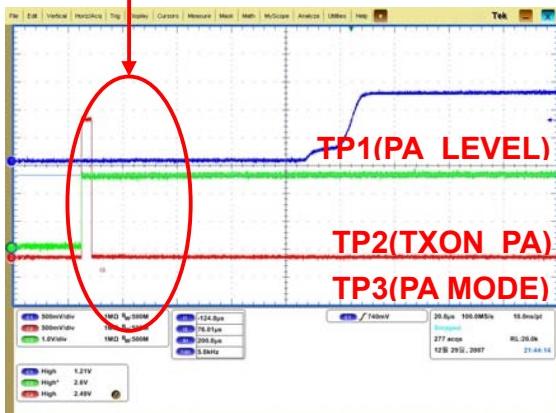
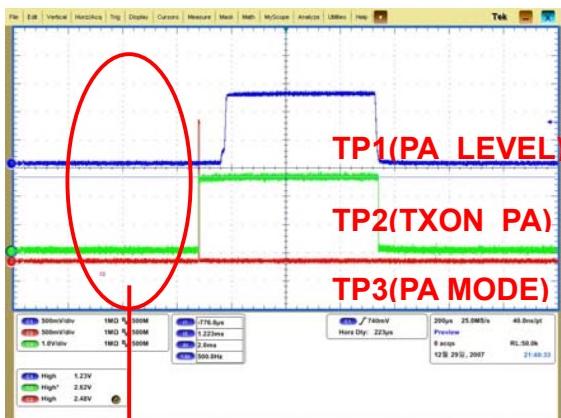
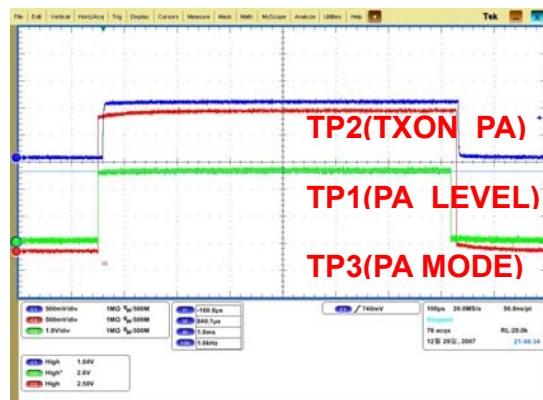


Figure 27. 8PSK Control Signal



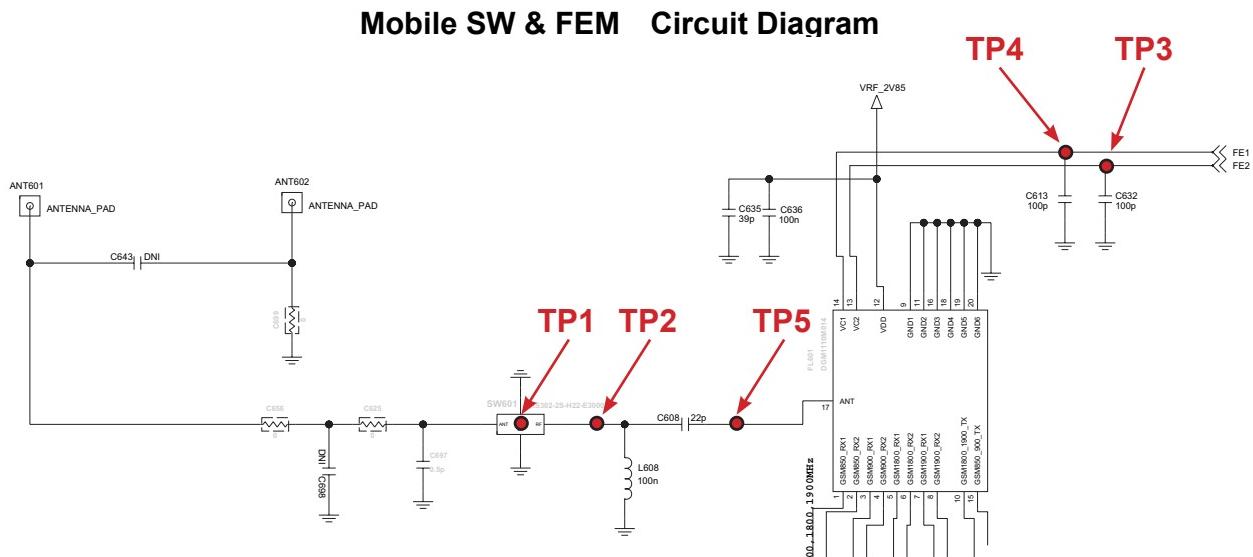
TP3(PA MODE) : R606

TP1(PA\_LEVEL) : R607

TP2(TXON\_PA) : C633

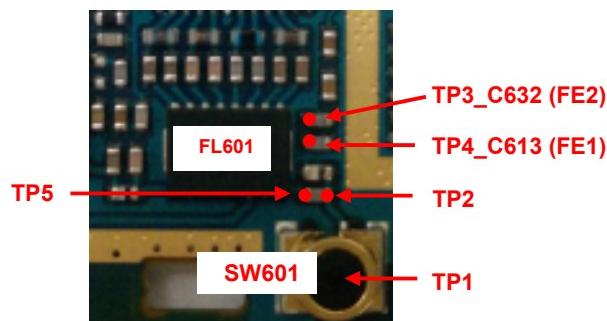
## 5. Trouble shooting

### 5.13.6. Checking FEM & Mobile SW



**Figure 28. Mobile SW & FEM Circuit**

### Checking Points



**Figure 29 Mobile SW & FEM**

**Table 5. FEM TX Control Logic**

	EGSM/GSM850	DCS/PCS
FE1	OFF	ON
FE2	ON	ON

## 5. Trouble shooting

### Checking Flow

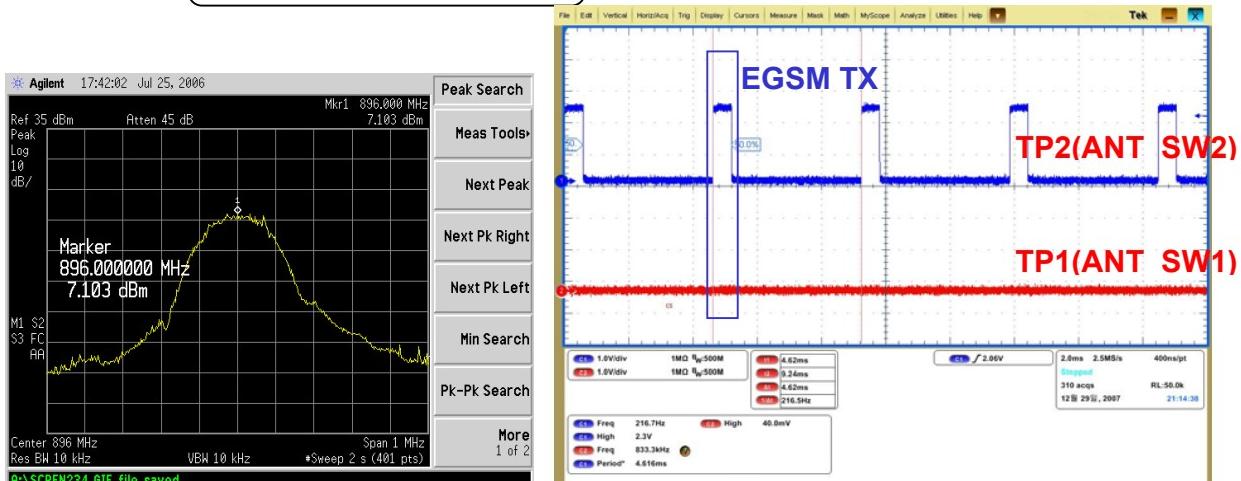
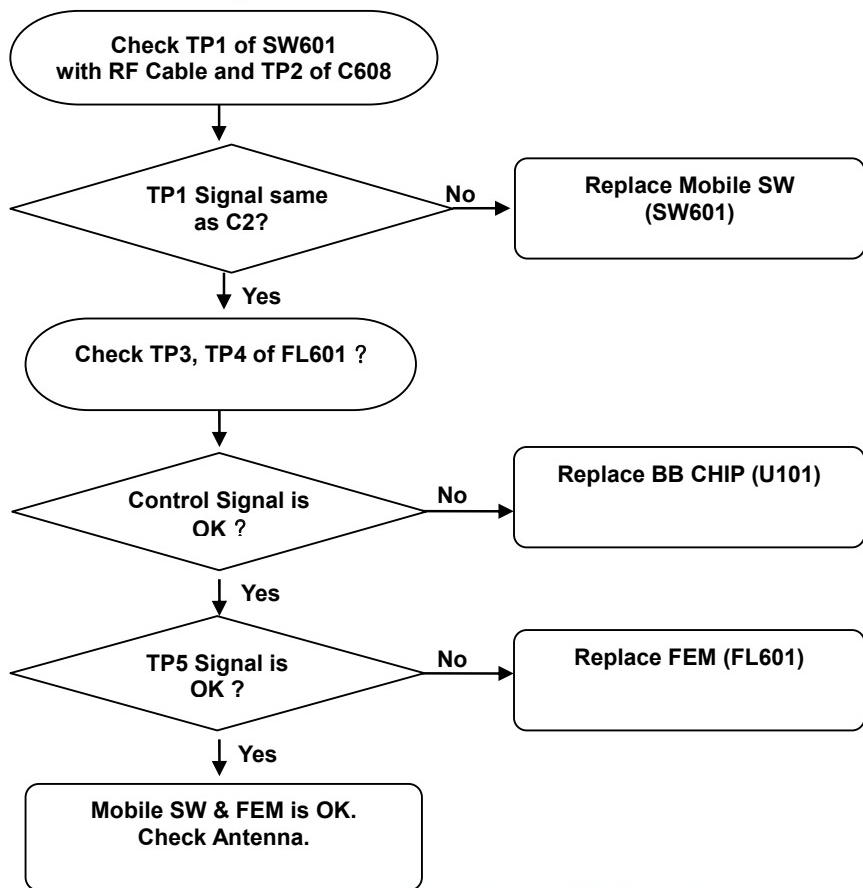


Figure 30 Mobile SW

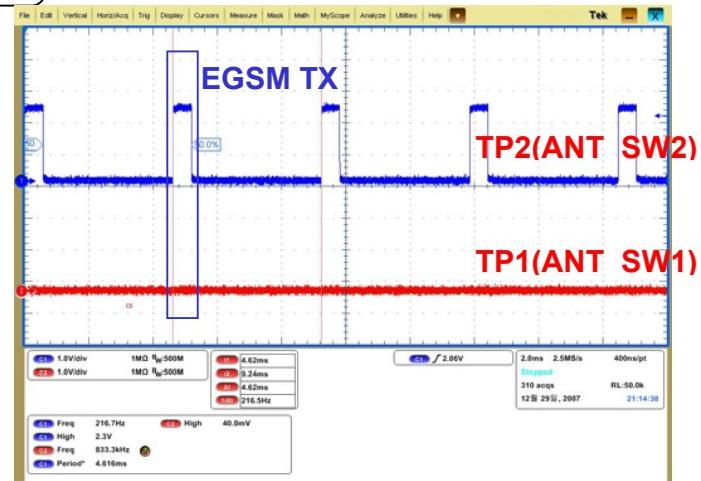
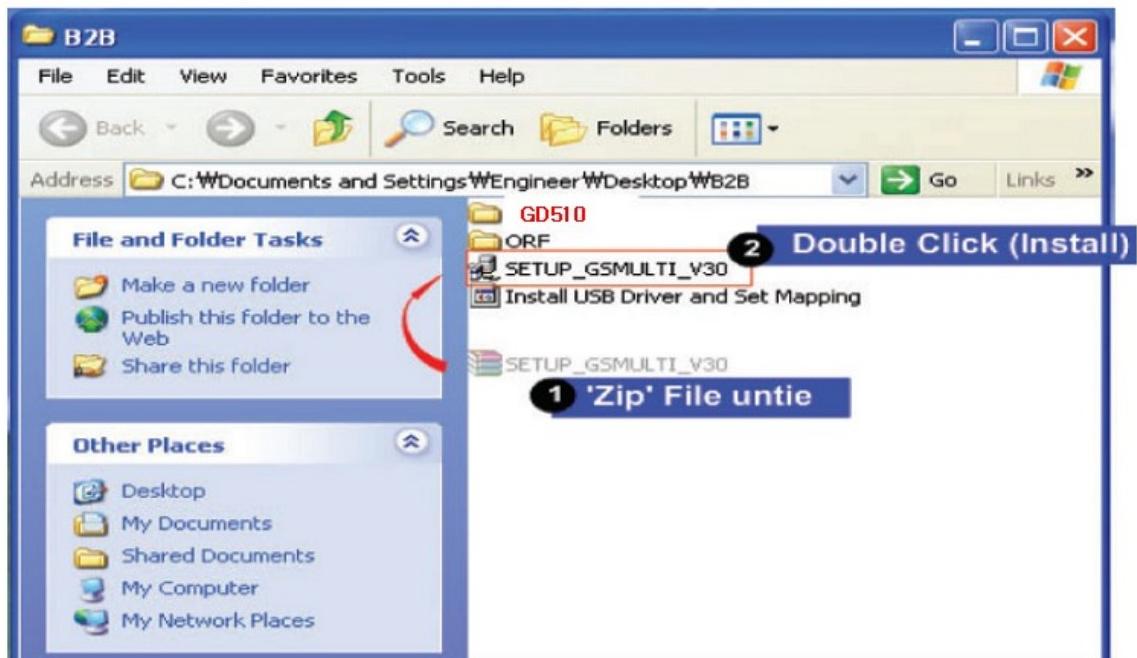
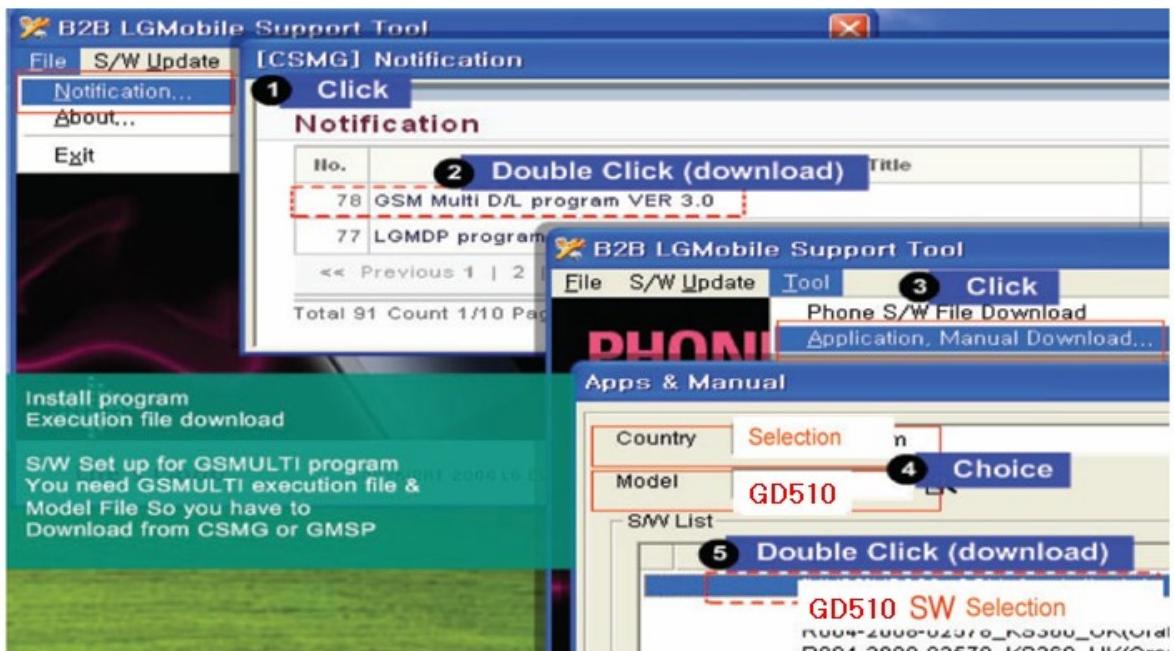
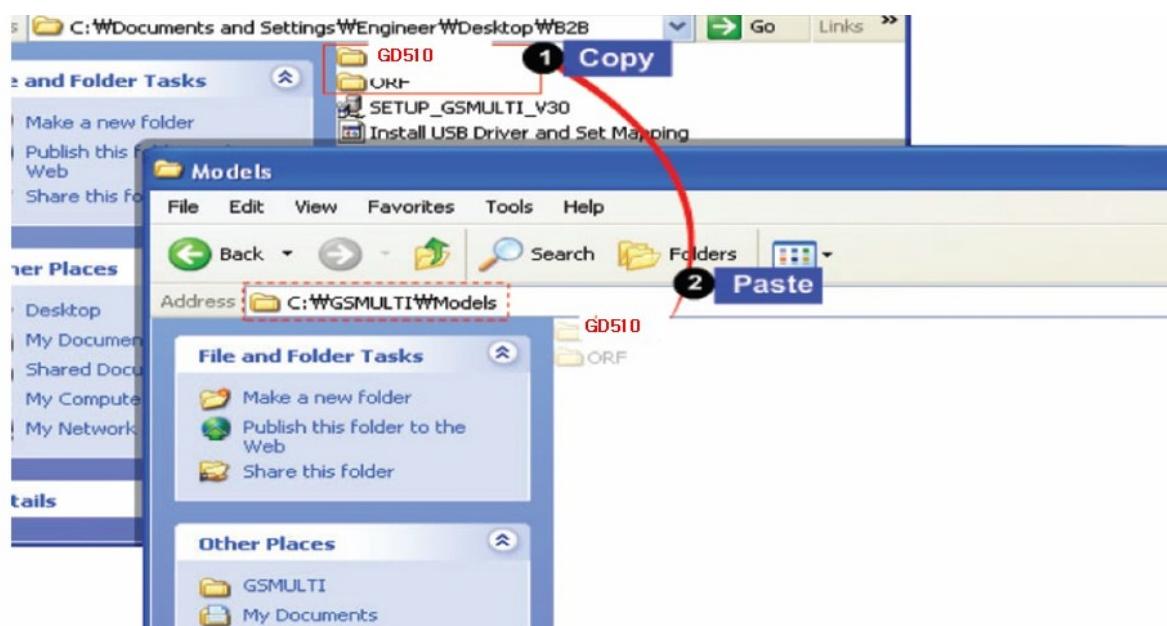
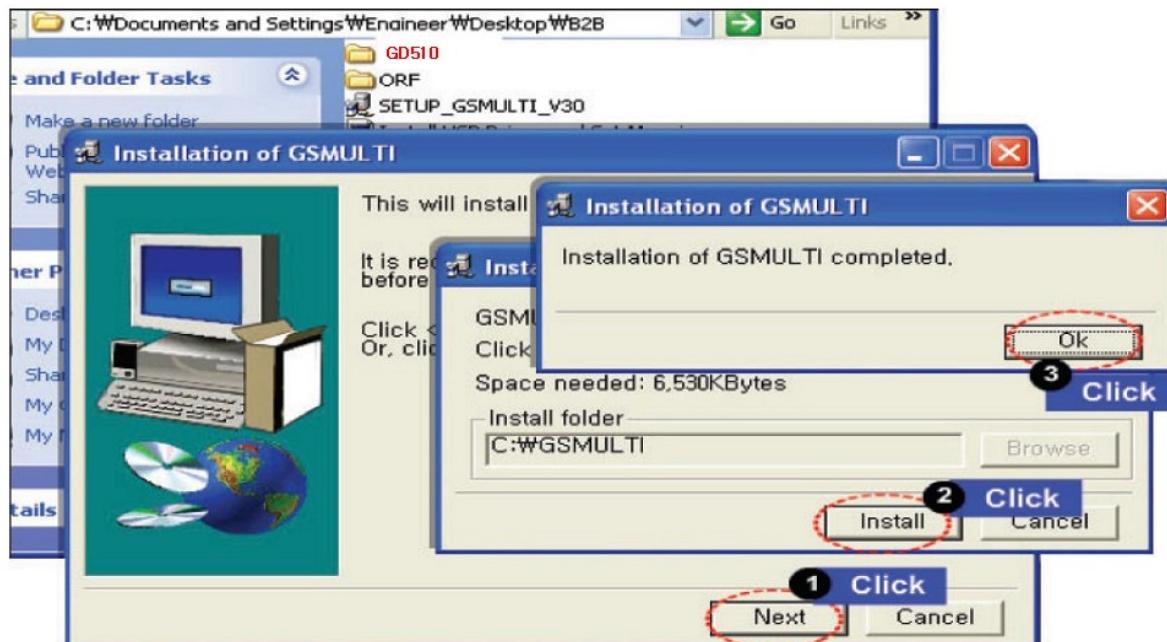


Figure 31 FEM Control Signals

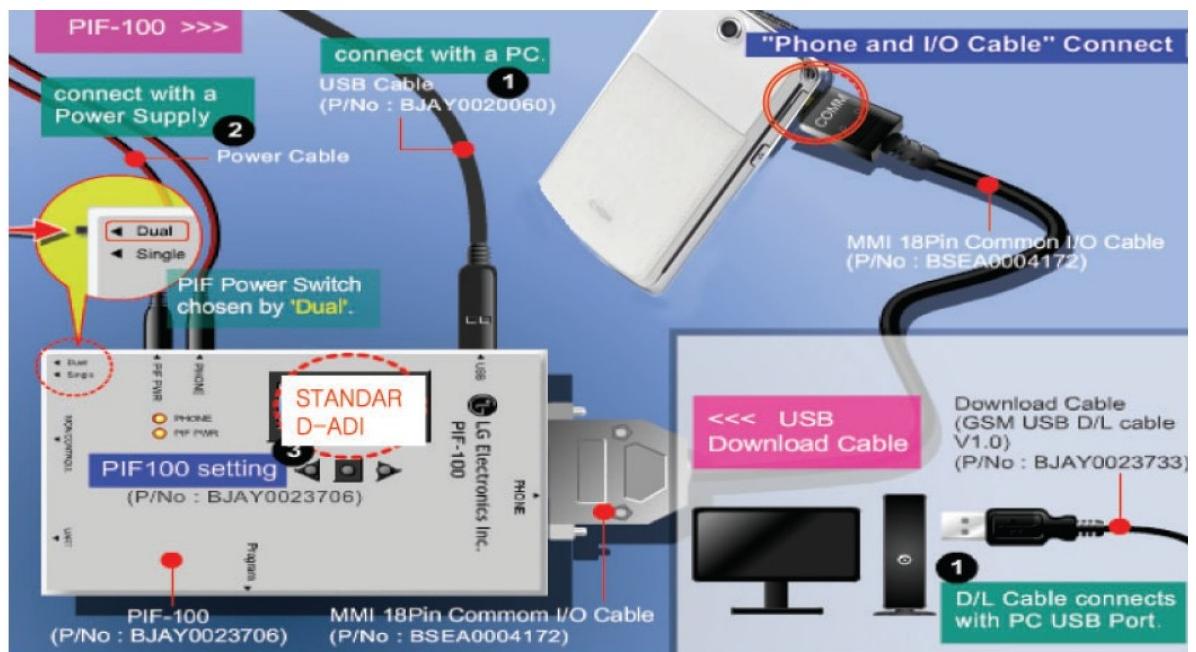
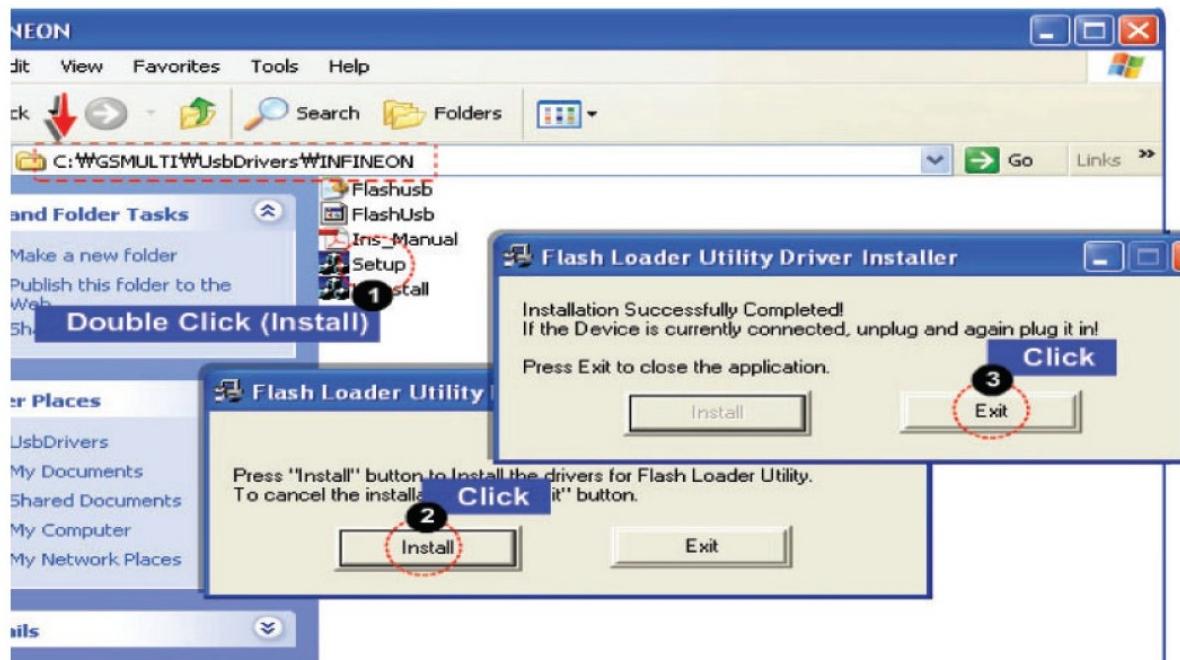
### 6. DOWNLOAD & S/W UPGRADE



## 6. DOWNLOAD & S/W UPGRADE

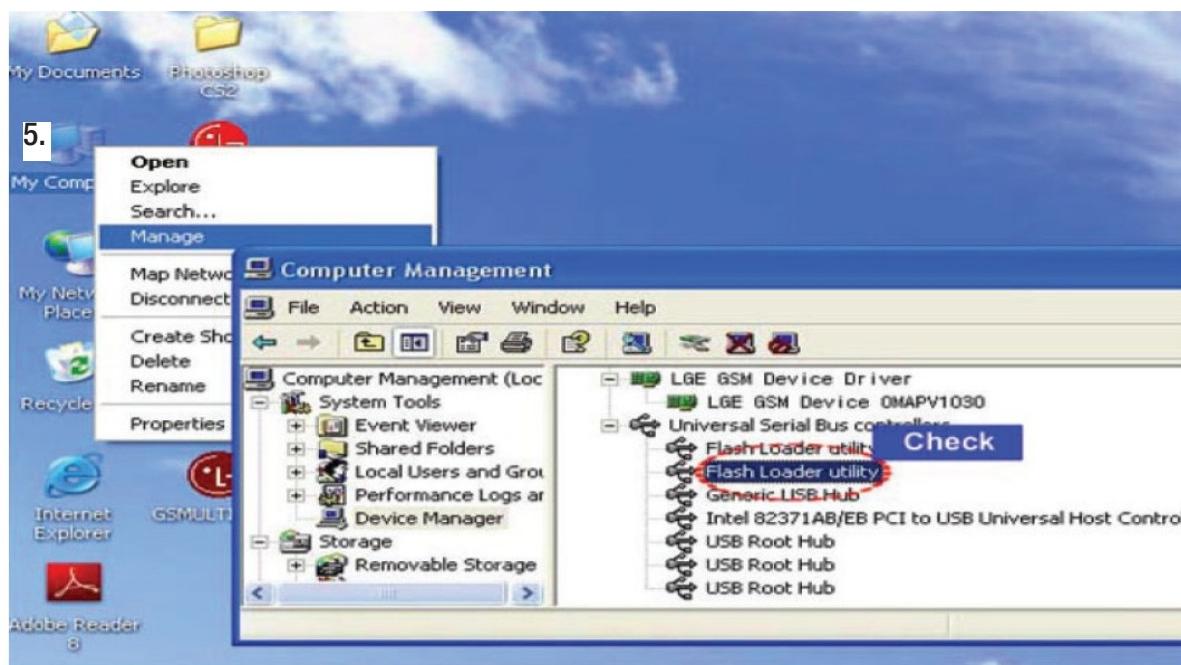


## **6. DOWNLOAD & S/W UPGRADE**

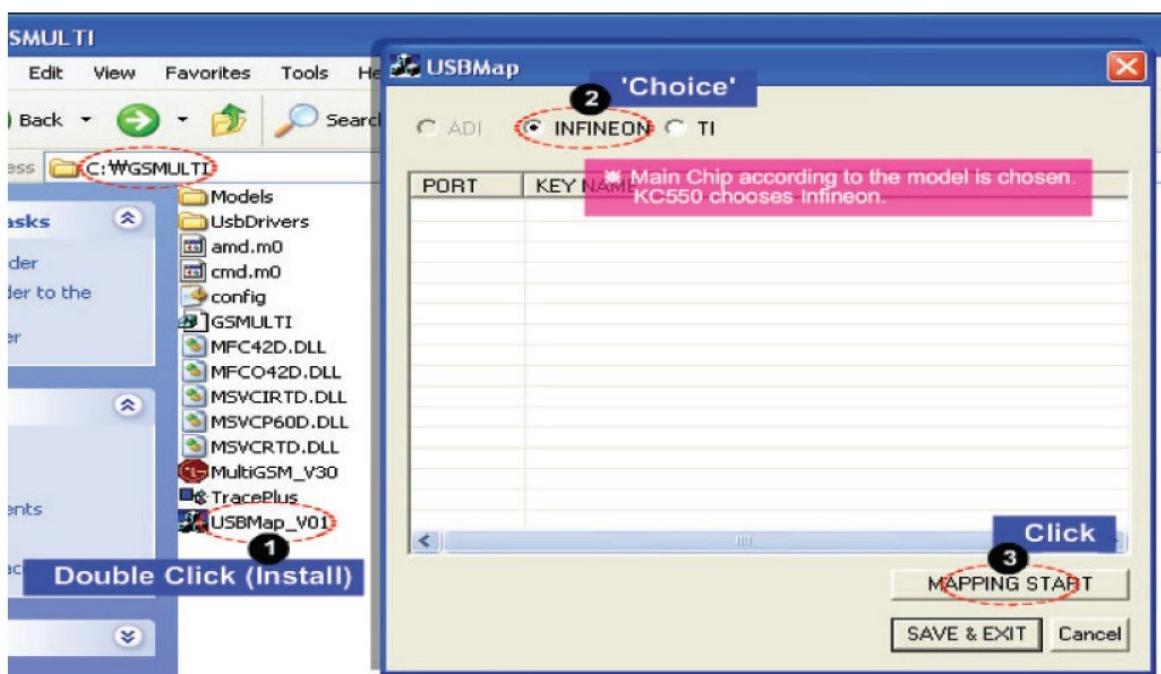
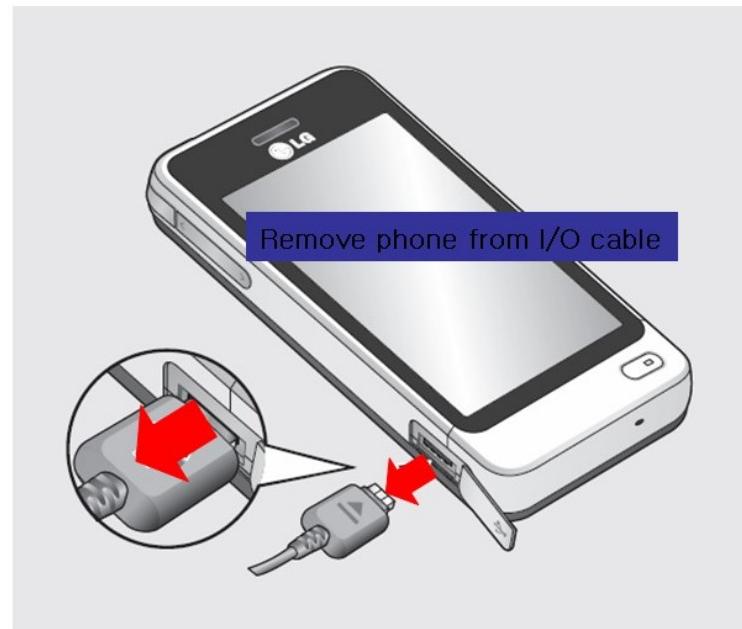


6.

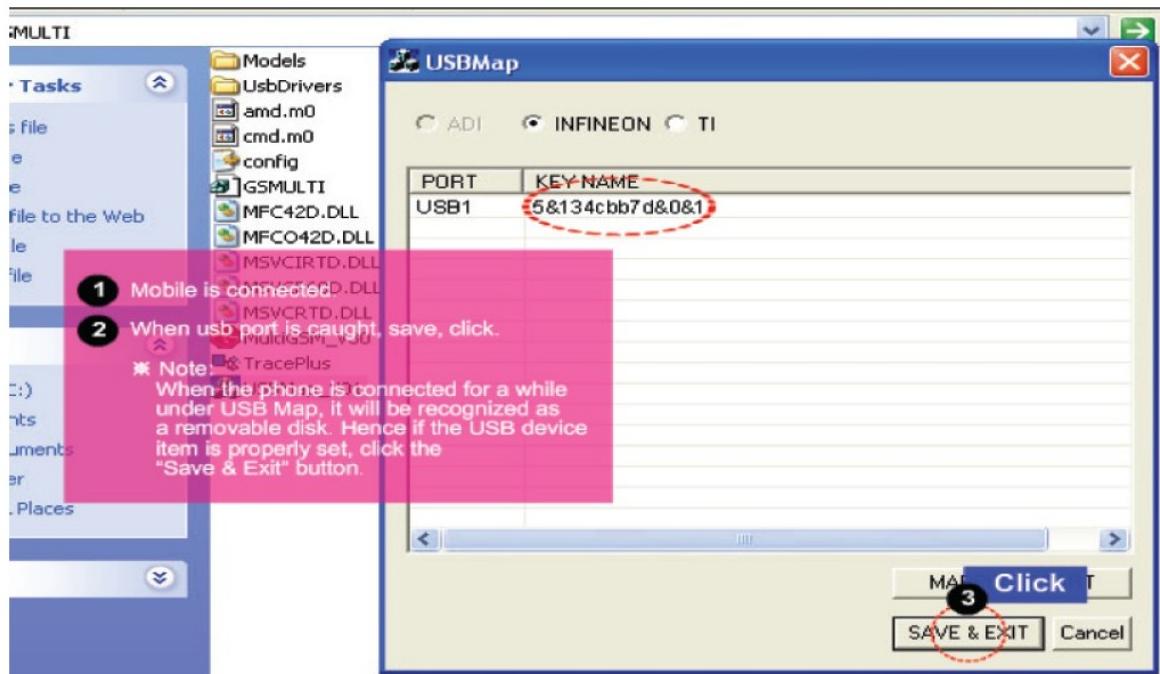
## 6. DOWNLOAD & S/W UPGRADE



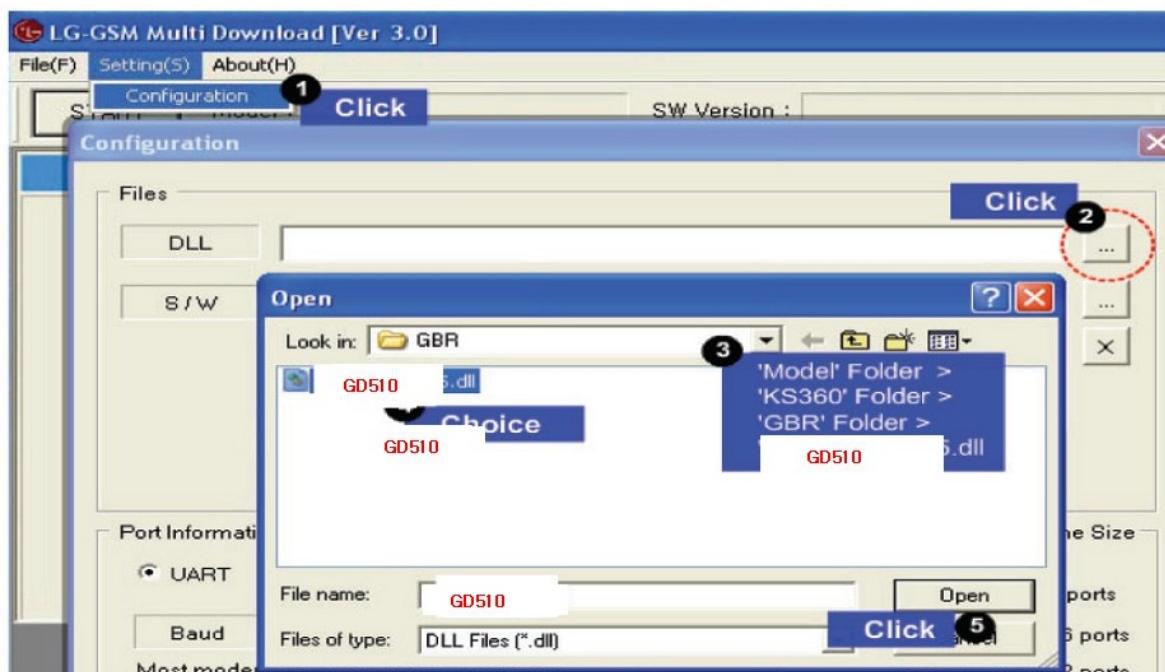
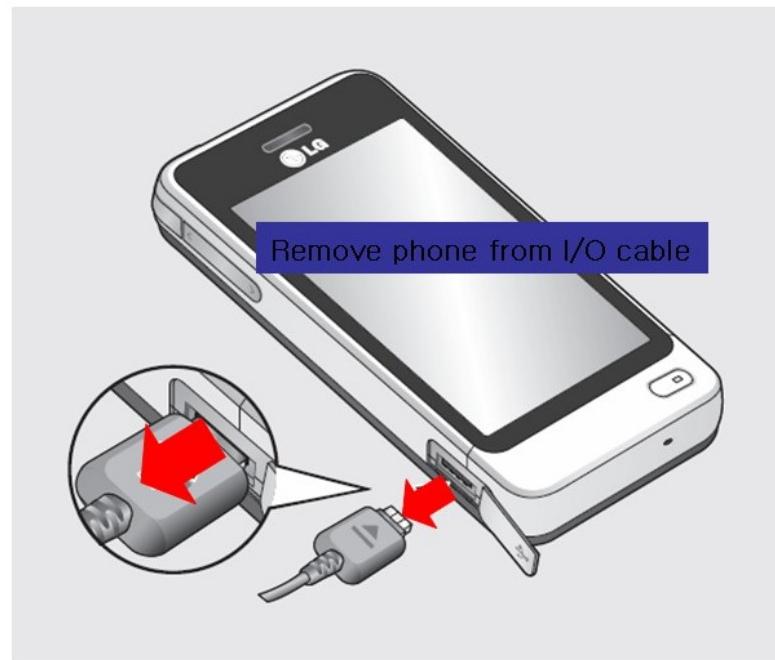
## 6. DOWNLOAD & S/W UPGRADE



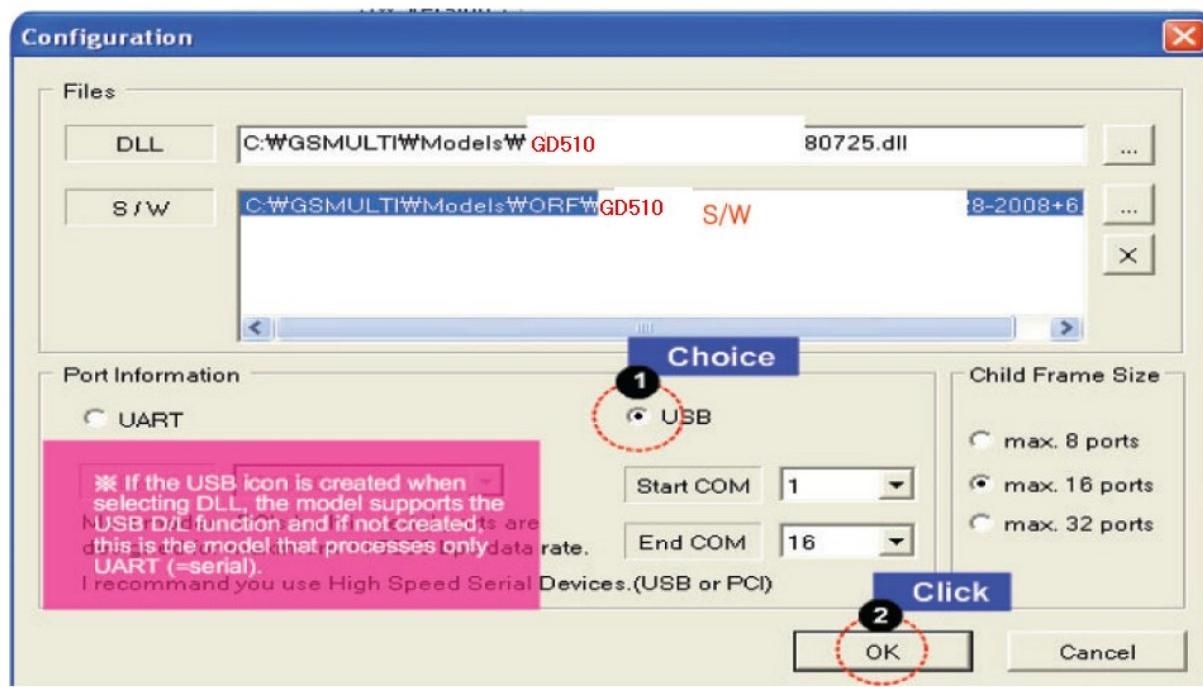
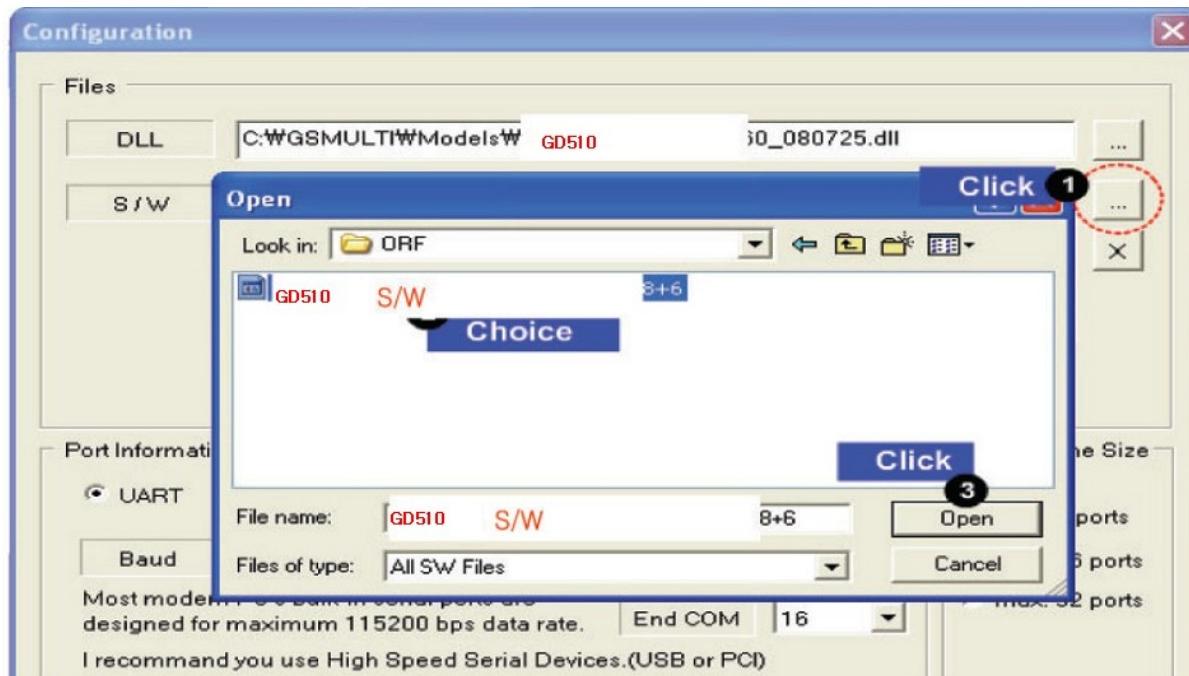
## 6. DOWNLOAD & S/W UPGRADE



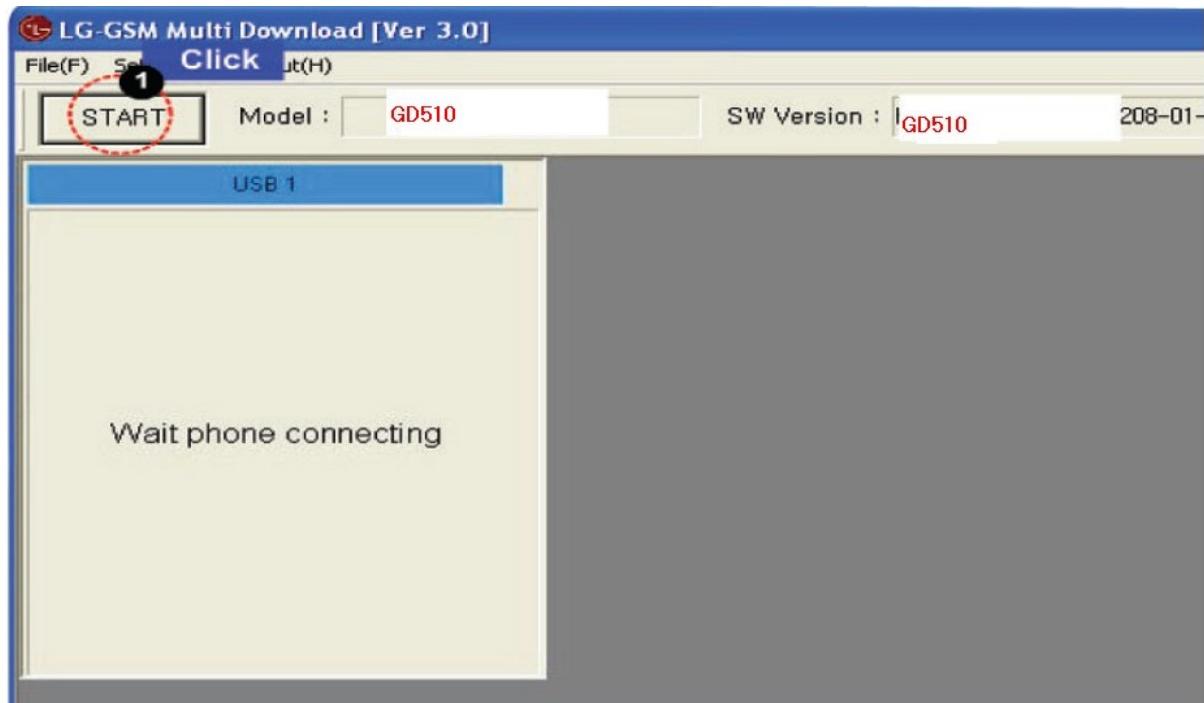
## 6. DOWNLOAD & S/W UPGRADE



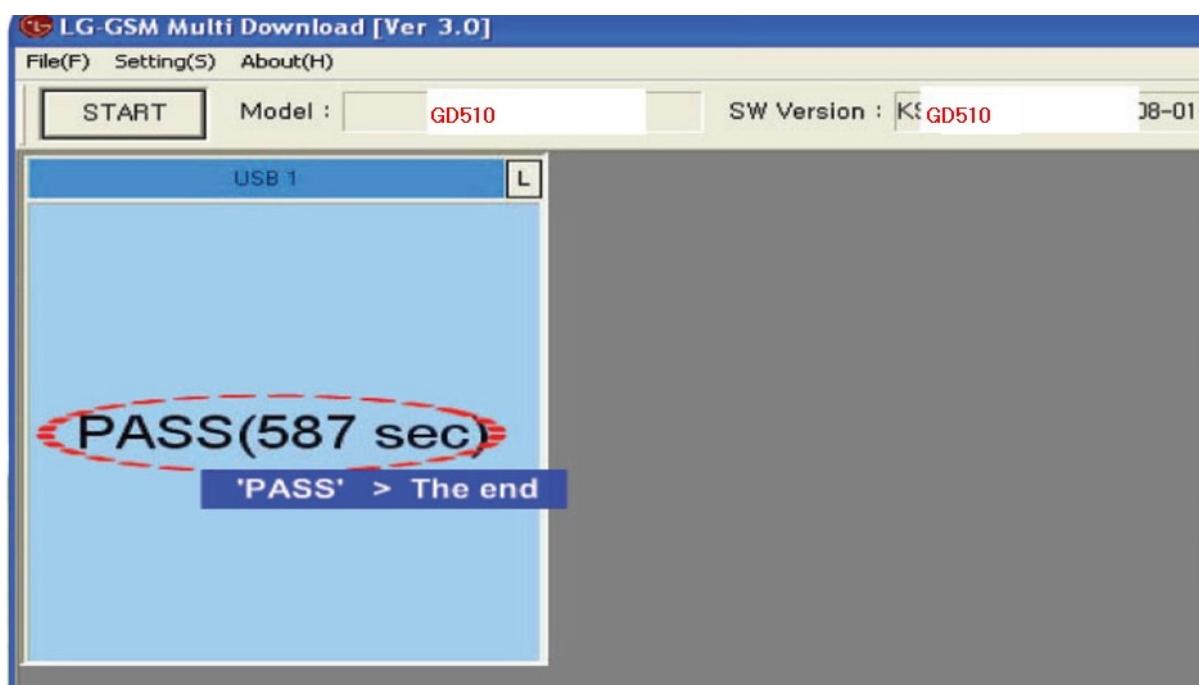
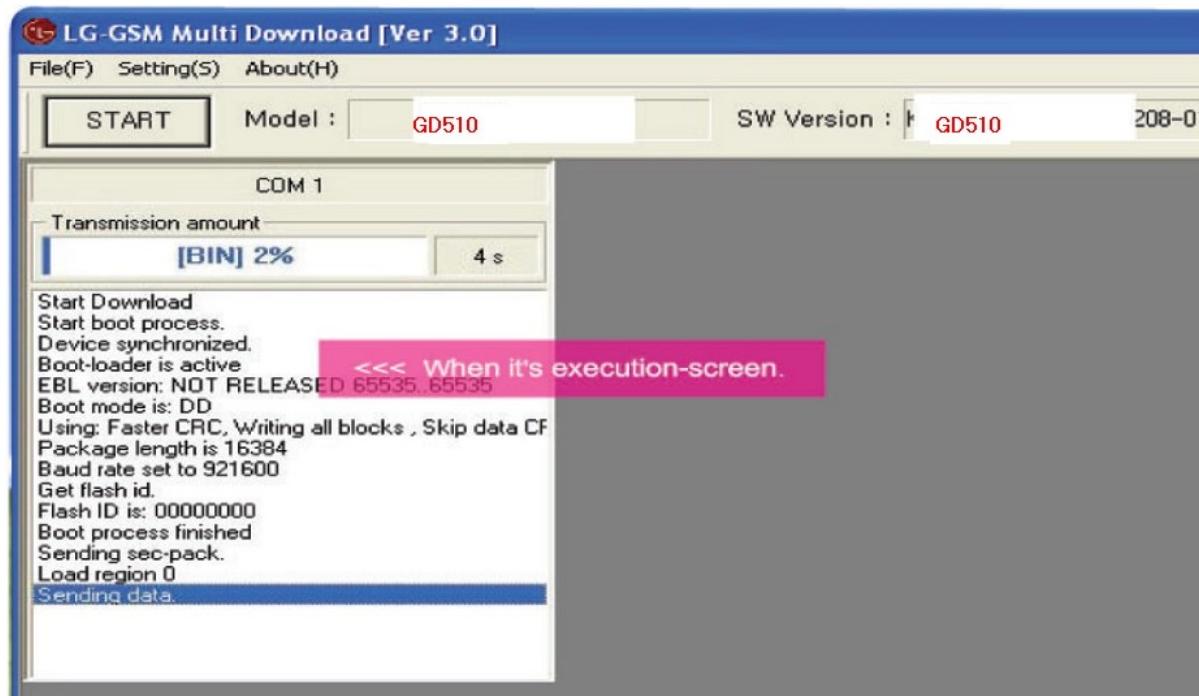
## 6. DOWNLOAD & S/W UPGRADE



## 6. DOWNLOAD & S/W UPGRADE



## 6. DOWNLOAD & S/W UPGRADE

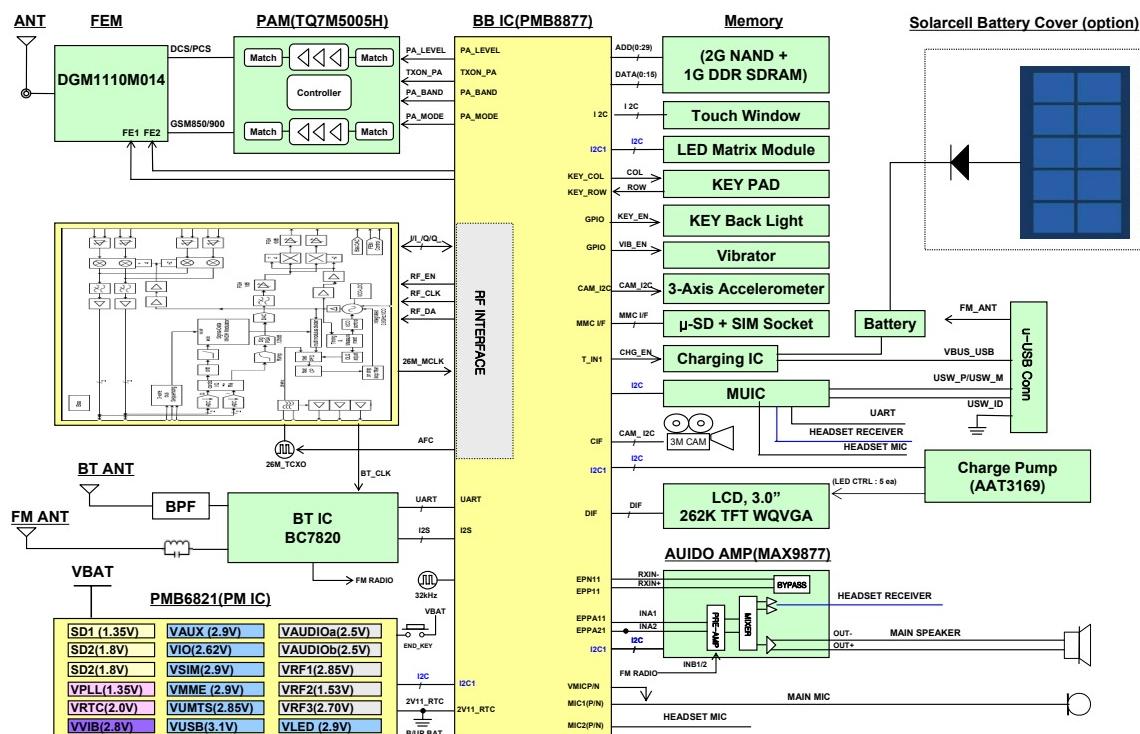


## 7. BLOCK DIAGRAM

### 7. BLOCK DIAGRAM

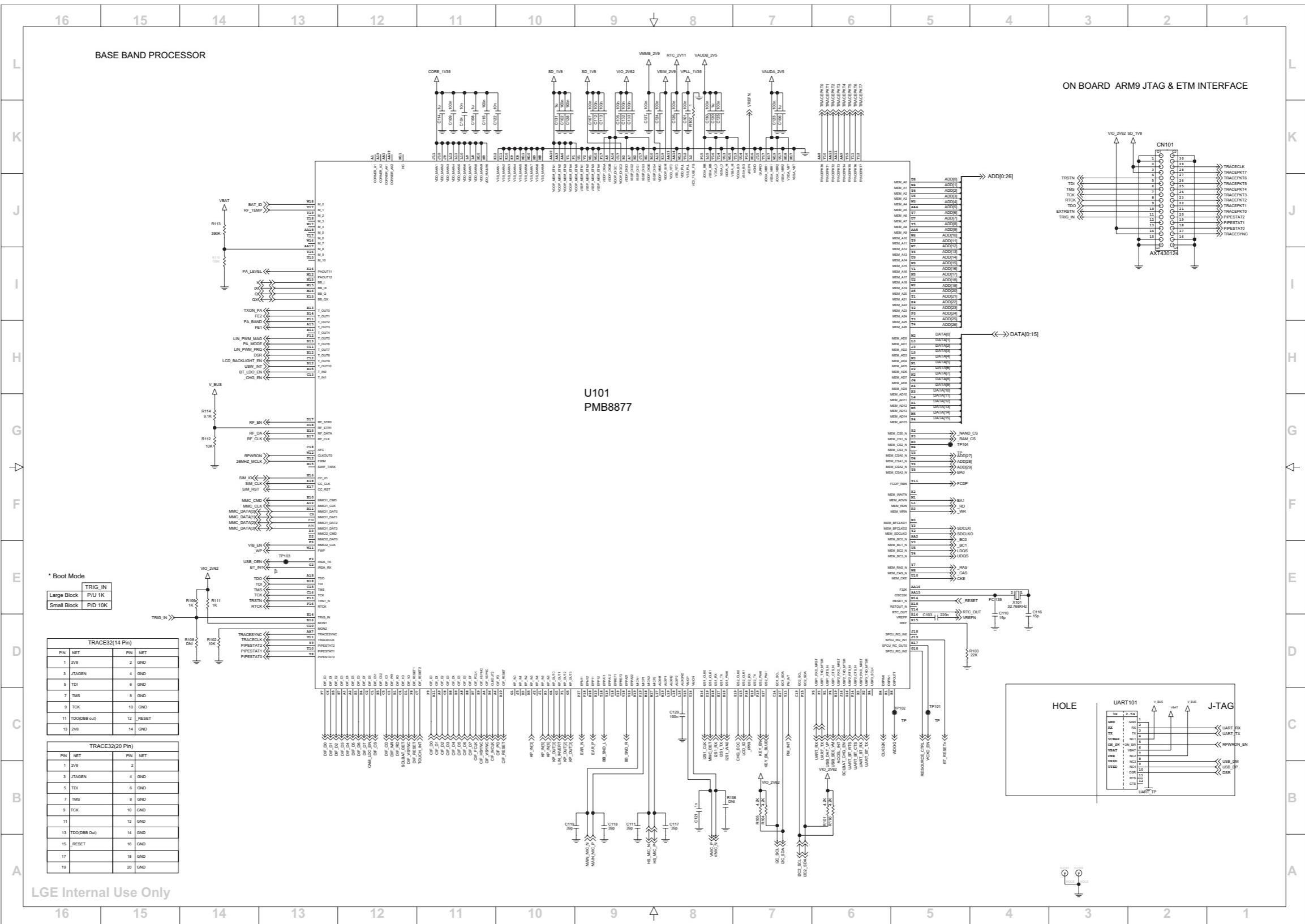
GD510 BLOCK DIAGRAM(0723)

LGE Secret

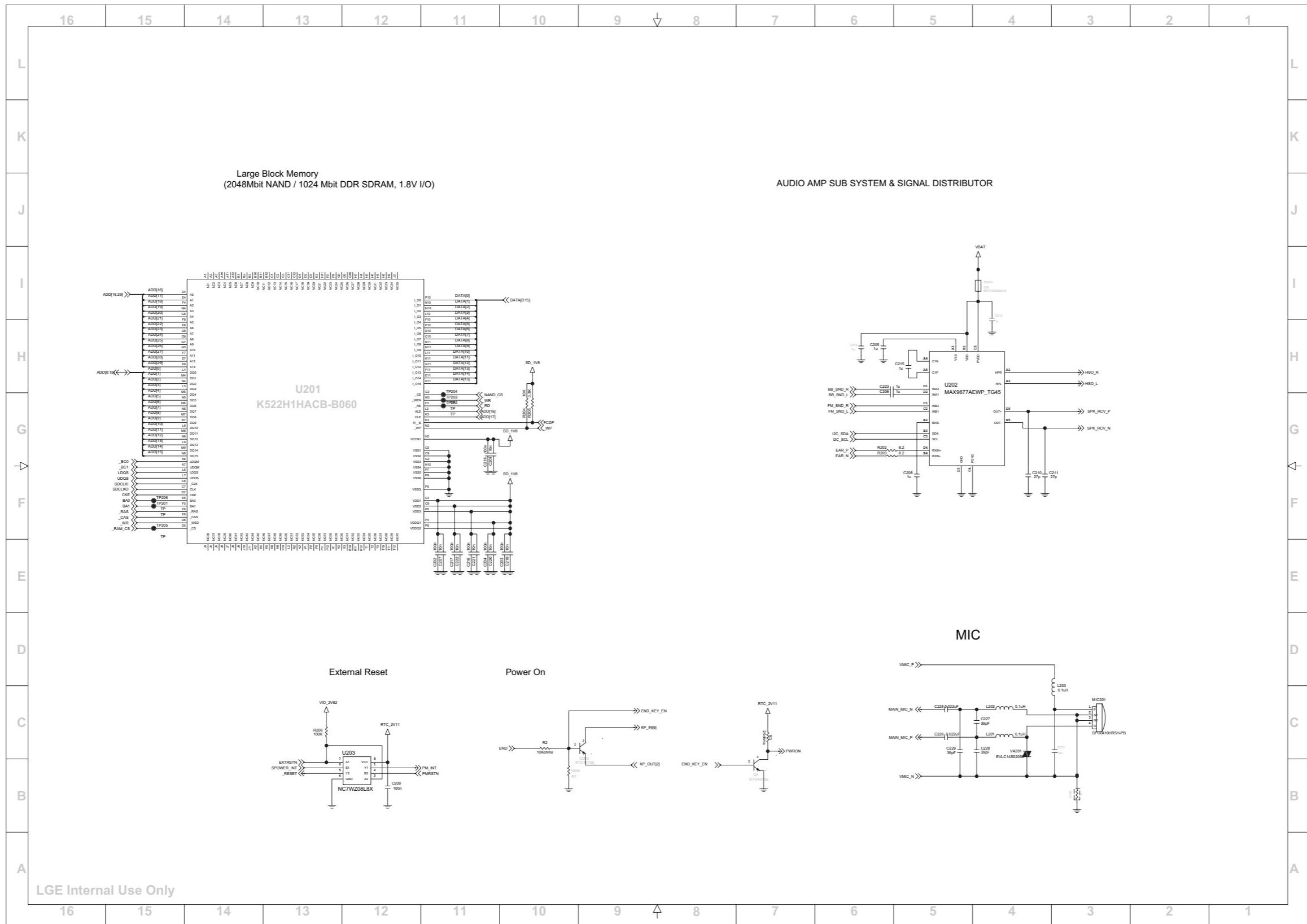




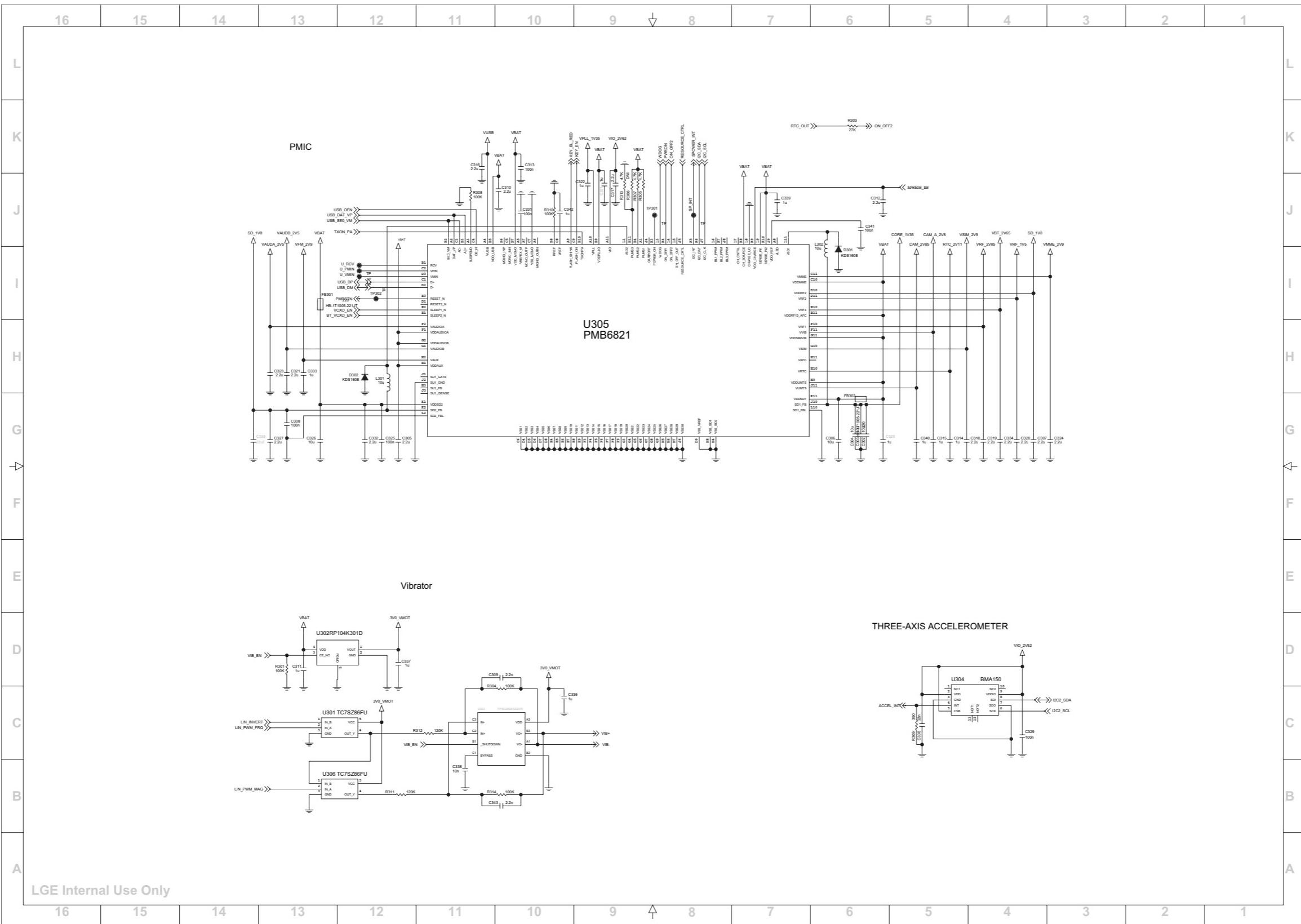
## 8. CIRCUIT DIAGRAM



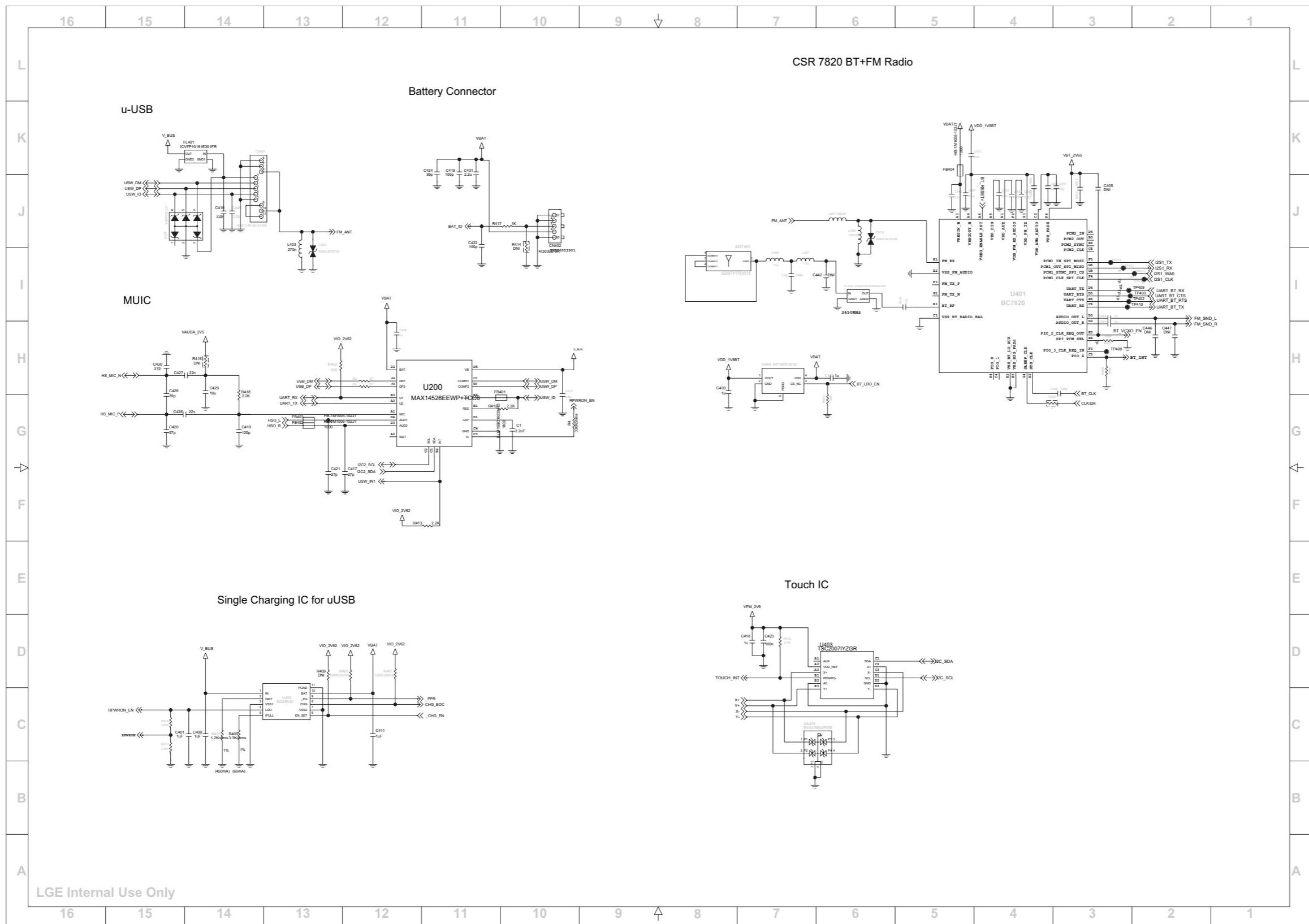
## 8. CIRCUIT DIAGRAM



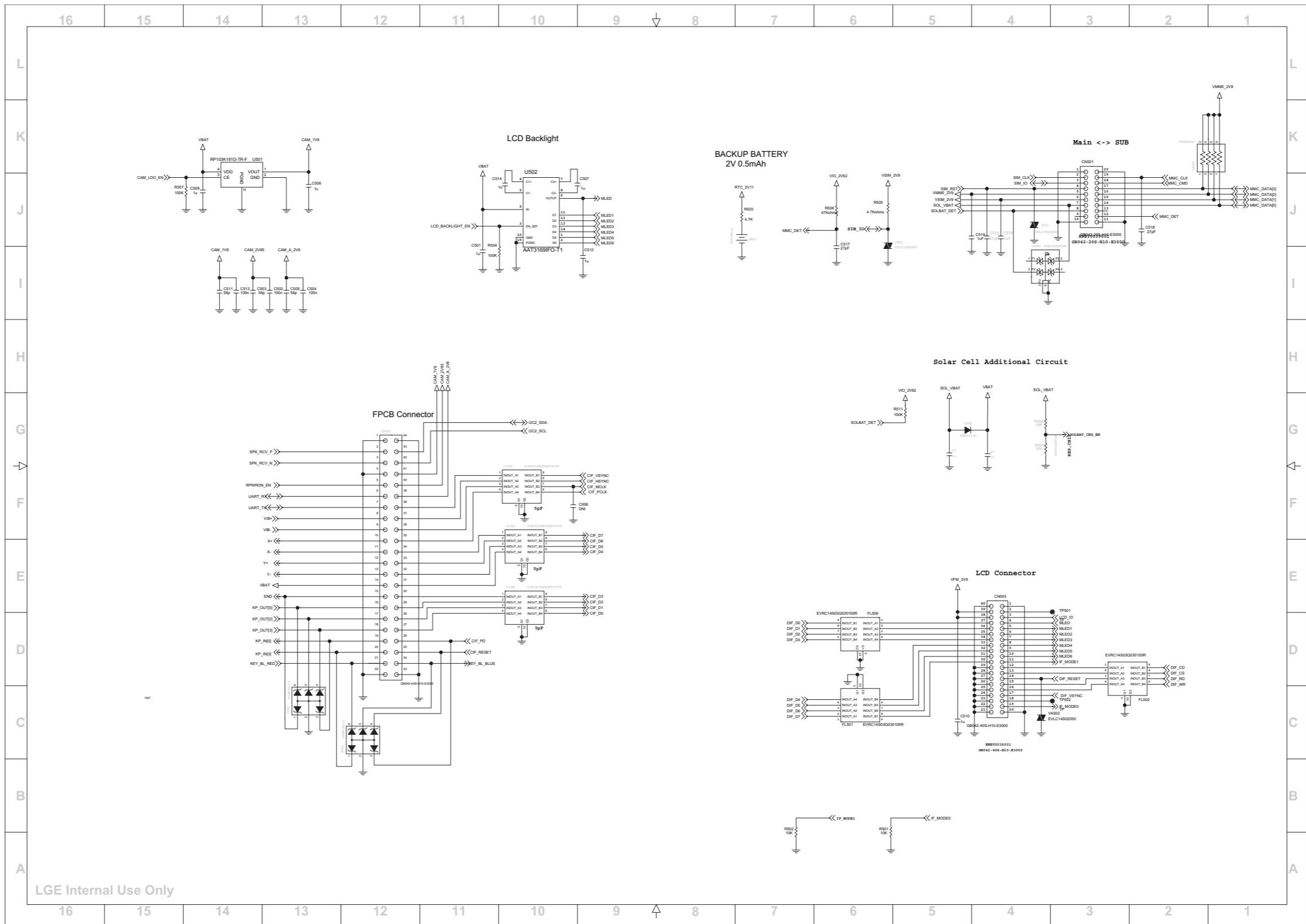
## **8. CIRCUIT DIAGRAM**



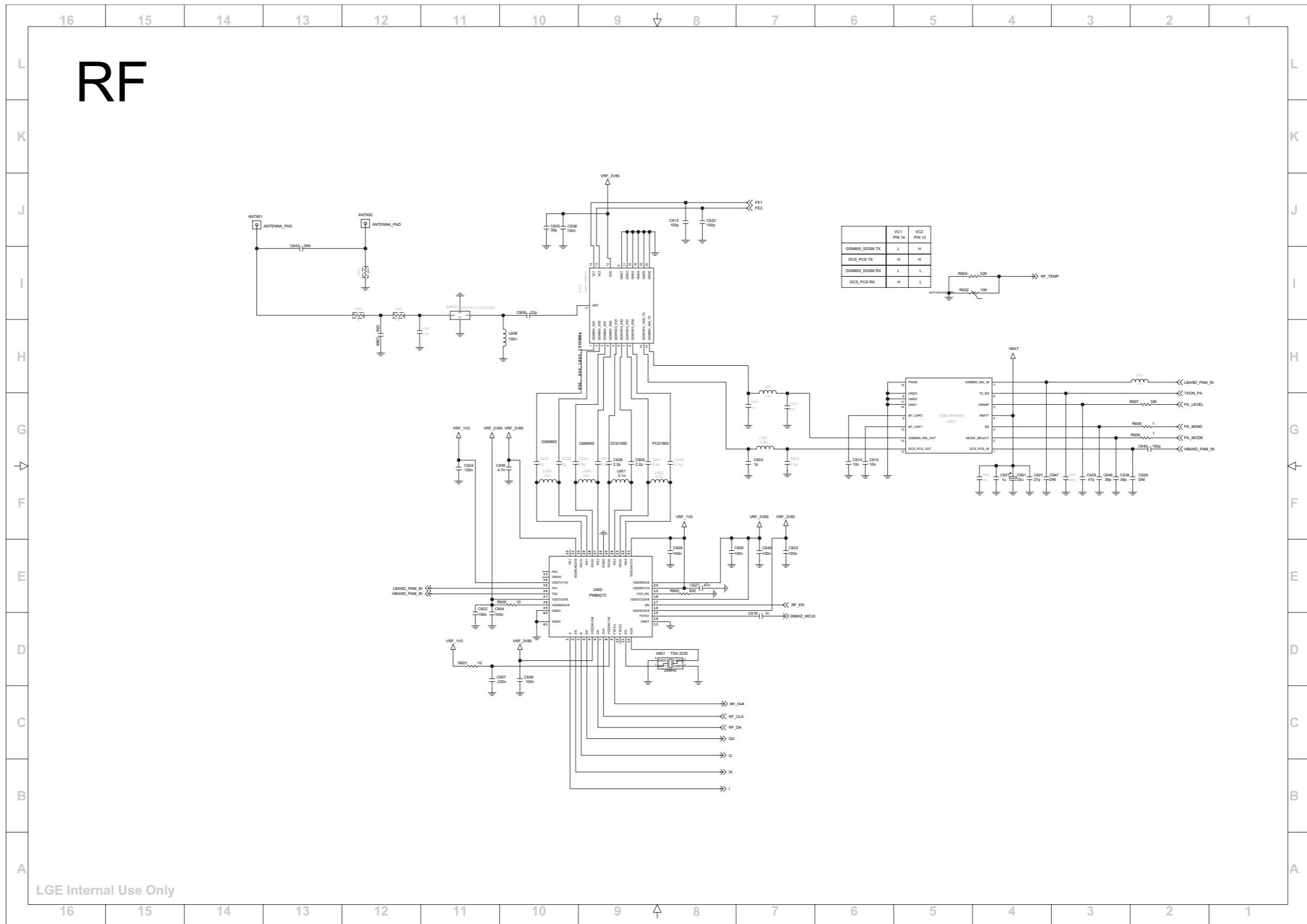
## 8. CIRCUIT DIAGRAM



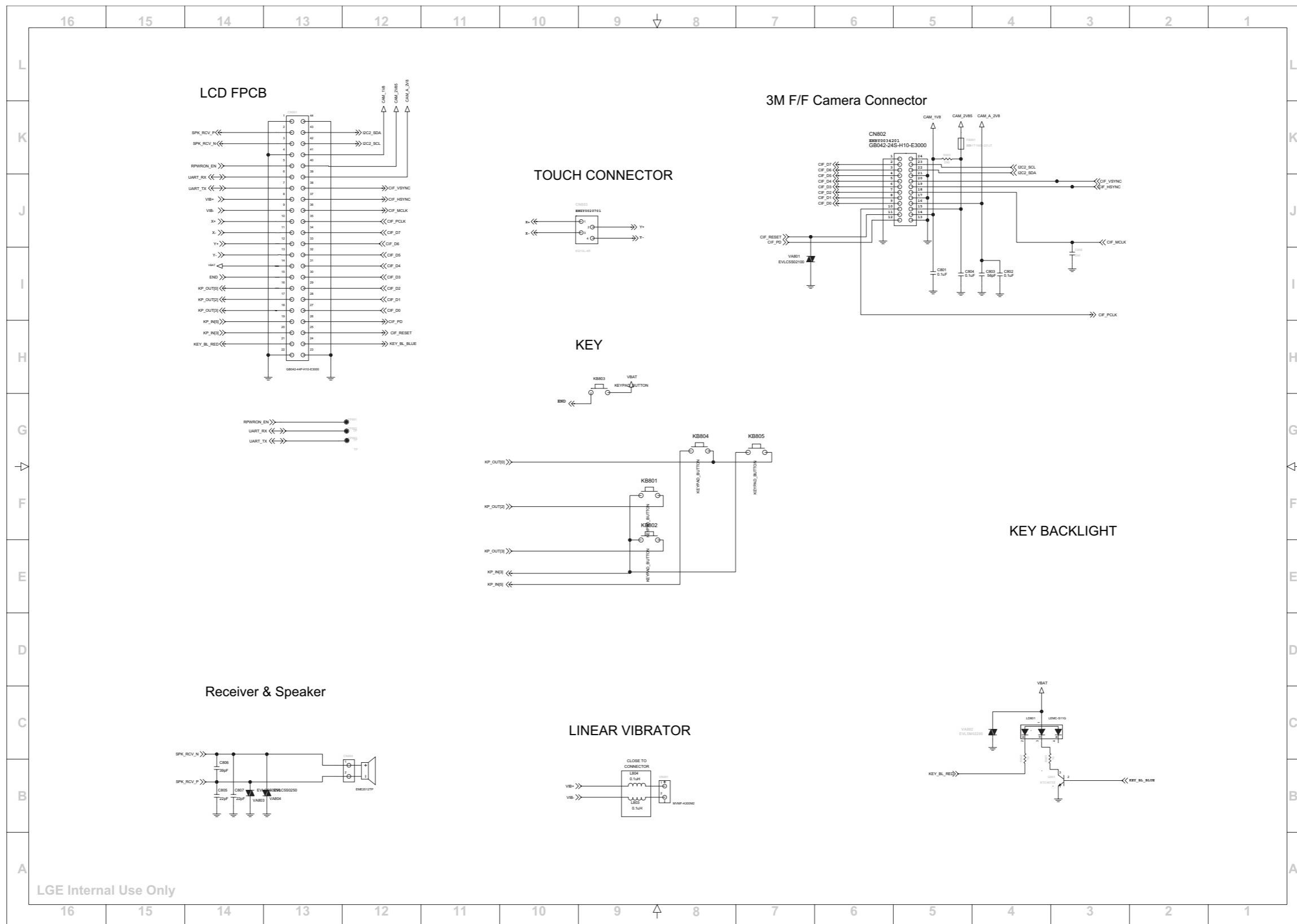
## 8. CIRCUIT DIAGRAM



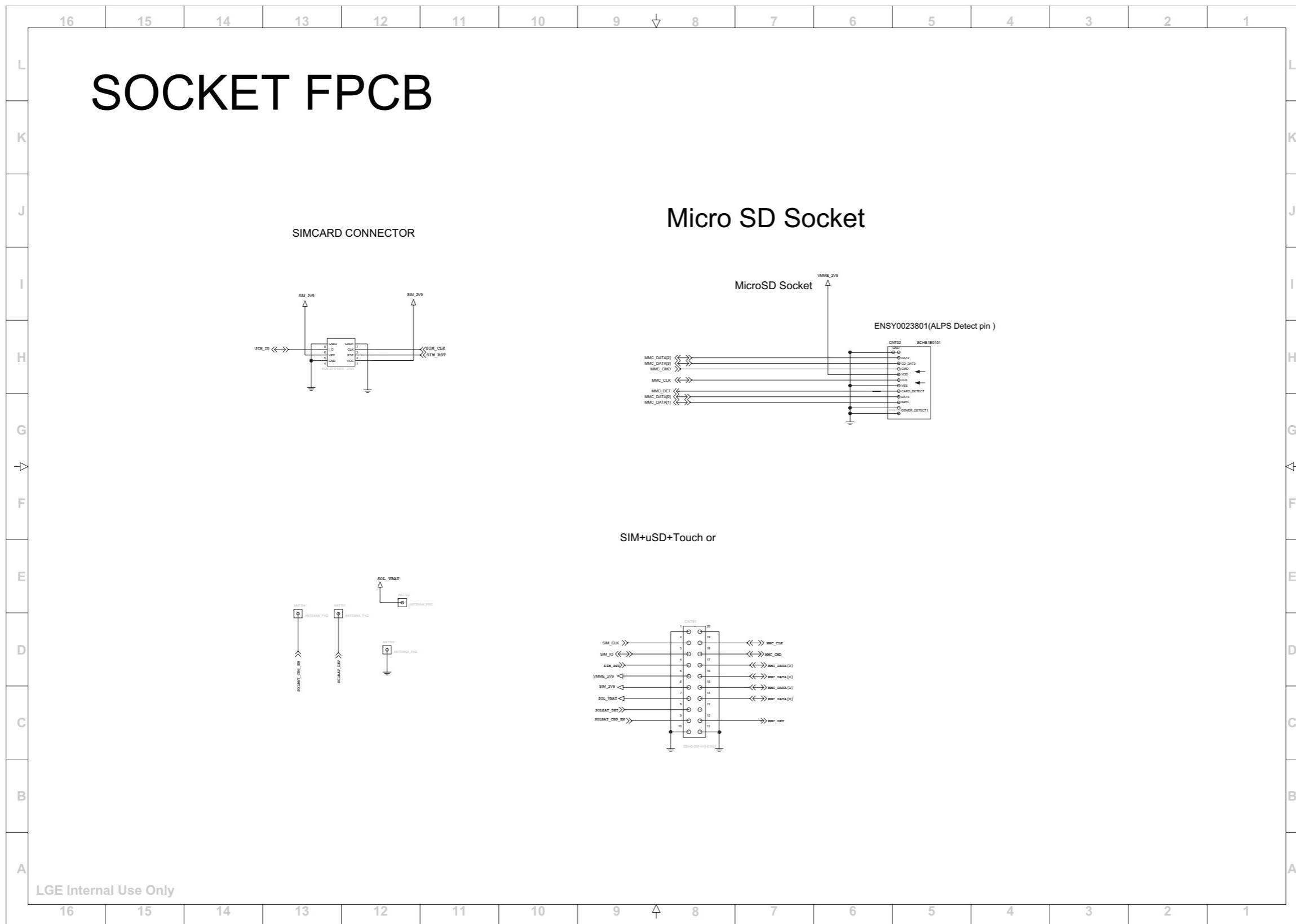
## 8. CIRCUIT DIAGRAM



## 8. CIRCUIT DIAGRAM

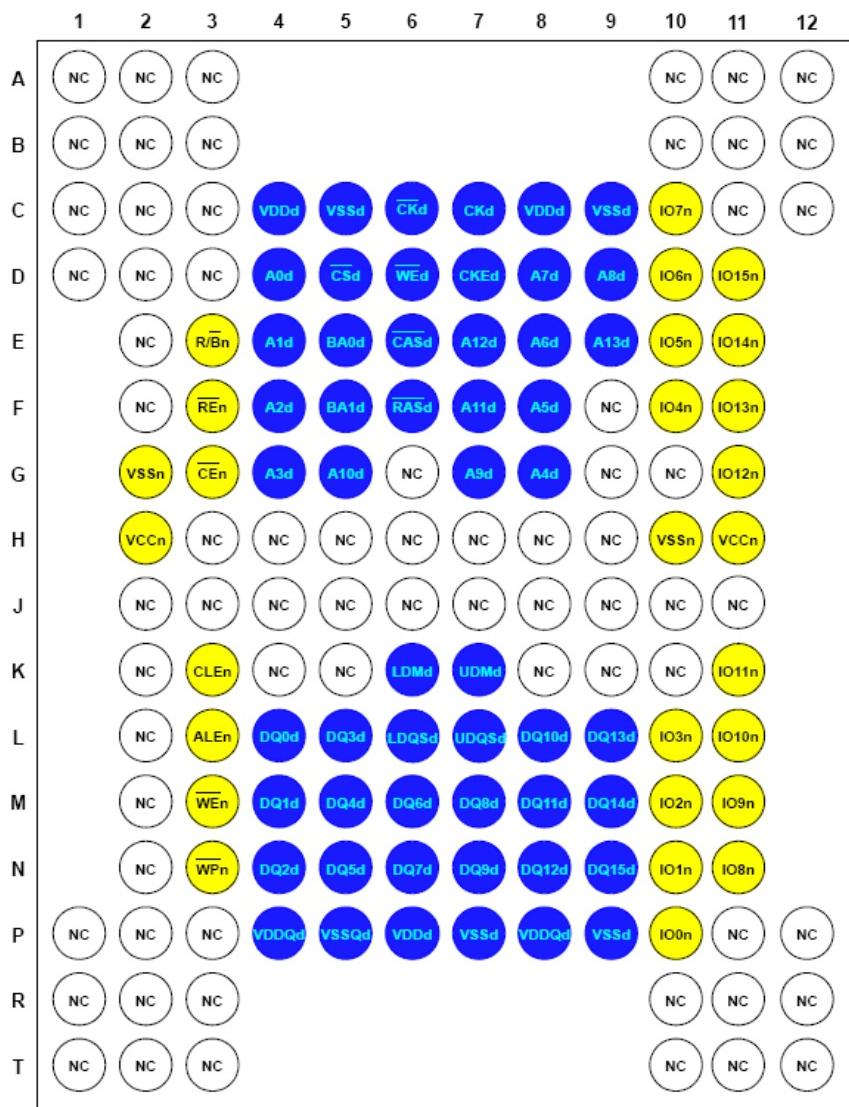


## 8. CIRCUIT DIAGRAM

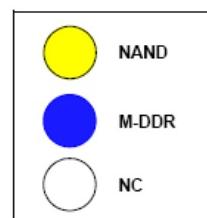


## 9. BGA Pin Map

**K522H1HACB (memory)**



149 FBGA: Top View (Ball Down)



## 9. BGA Pin Map

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**BC7820**

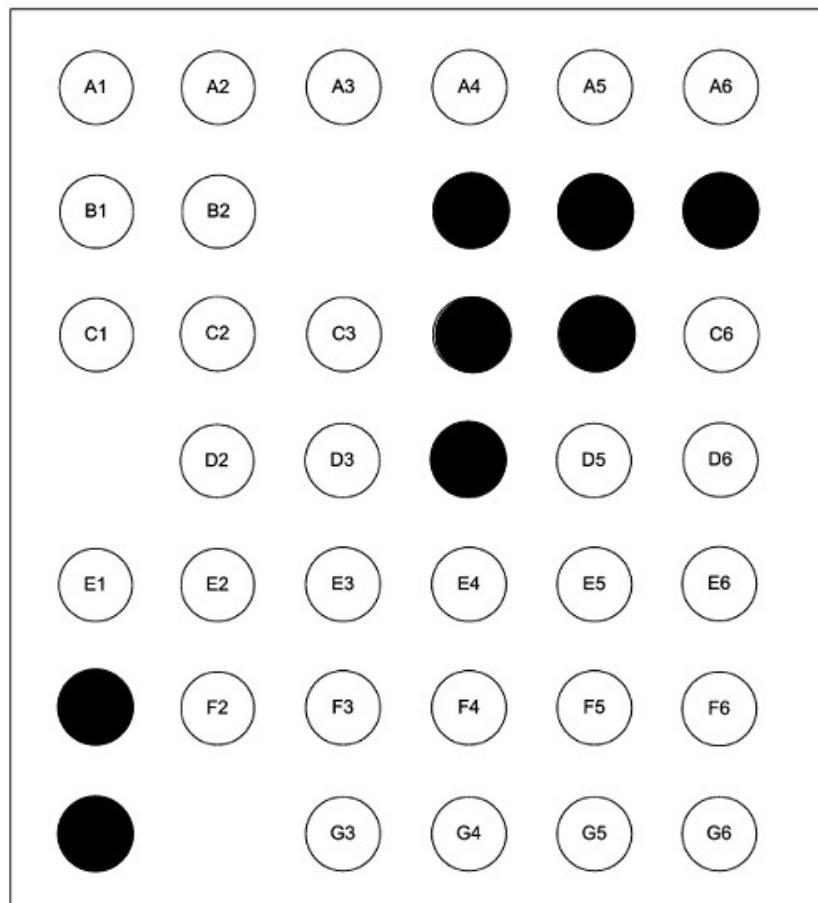


Figure 3.1: Device Pinout



NC

### PMB6821

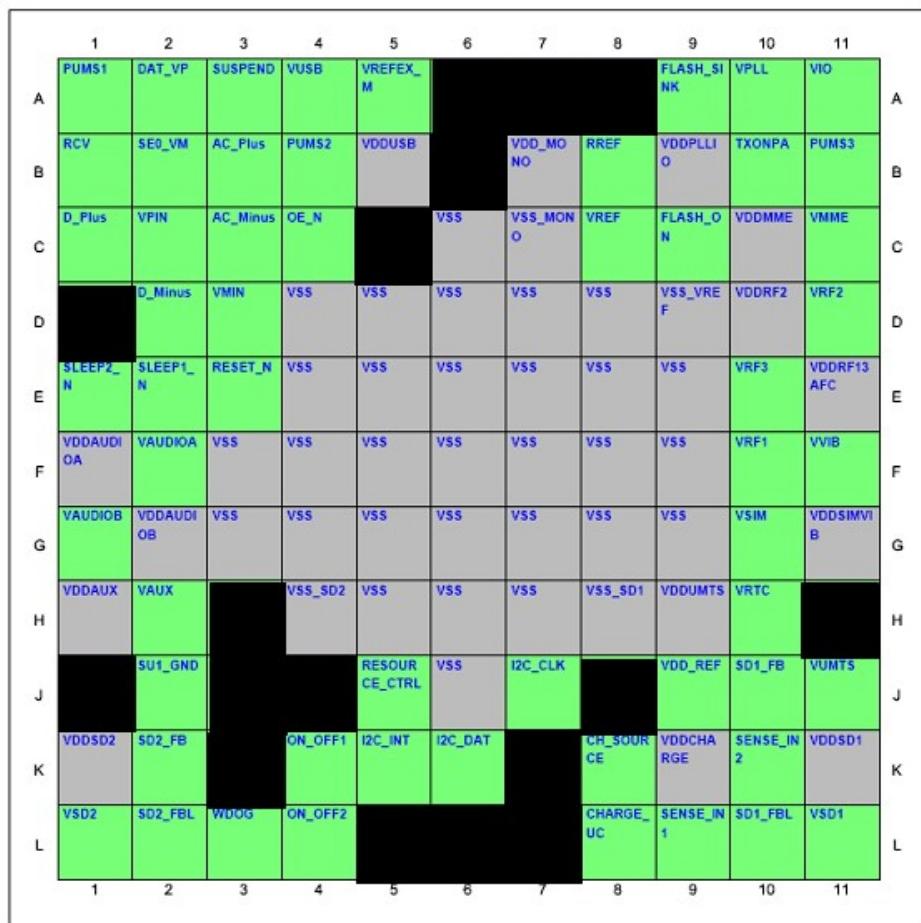


Figure 2 Ball Diagram for PG-WFSGA-121 (Top view)



NC

## 9. BGA Pin Map

**PMB8877**

	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	T	U	V	W	Y	AA	
19	CORNER_A	I2S1_WAI	I2S2_SCL	I2S1_CLK1	I2S2_TX	I2S2_WAO	I2S2_CLK0	I2S2_RXD_MIF	I2S2_RXD_MIF	I2S2_RXD_MIF	I2S2_RXD_MIF	VDDP_SIM	AUXN2	AUXPI	MICN1	MICP1	EPP1	EPPA1	EPRF	EPPA2	M_2	CORNER_A
18	TOO	TDI	AFC	RF_STRT	I2S1_RX	I2S2_RX	I2S2_RXD_MIF	EPR1	EPPA1	EPRF	EPA2	M_3	M_5									
17	I2C1_SDA	RF_CLK	VDDP_DIGC	RF_STRO	I2S1_RX	I2S2_RX	I2S2_RXD_MIF	EPR1	EPPA1	EPRF	EPA2	M_6	M_8									
16	VDDP_DIGC	MON1	TCK	DS1_CLK0	RTCK	JSIF2_RT3_N	CC_IO	I2S2_RXD_MIF	EPR1	EPPA1	EPRF	EPA2	M_7	M_9								
15	T_OUT3	T_IN0	TMS	RF_DATA	I2C2_SDA	I2S2_CLK1	SWF_I2RX	GUARD	BB_Q	AGND	VREFN	VSSA_VBR	VDDA_VBR	VSSA_VBR	VDDA_VBR	VSSA_VBR	VDDA_VBR	VSSA_VBR	VDDA_VBR	VSSA_M	TRACEPKT(S)	OSC32K
14	AMC1_DAT0	T_OUT1	I2C1_SCL	TRB2_N	USIF2_CTS_N															VSSA_D	VSSA_BG	RESET_N
13	VDDP_IMC	T_OUT6	T_IN1	T_OUT0	TRBT_N														VDDA_BG	VDDA_M	VDD_PLL	PM_IN
12	MMCH1_CLK	T_OUT10	T_OUT9	T_OUT8	T_OUT5					VSS_MAIN	VDD_MAIN	PAOUT1							VSS_PLL	F2BM	CLKOUT0	TRACEPKT(B)
11	QIF_D1	AMC1_DAT1	T_OUT7	T_OUT4	T_OUT2				VDD_MAIN	VSS_MAIN	VDD_MAIN	VSS_MAIN							FCDP_RBN	TRACECLK	FWP	TRACEPKT(B)
10	QIF_RESET	VSSP_DNG	MON2	MMCH1_CMD(MCH1_DAT[1])	MMCH1_CMD(MCH1_DAT[0])				VDD_MAIN	VSS_MAIN	VDD_MAIN	VSS_MAIN							PIPESTAT0	MEM_CKE	VSSP_MEM_E	TRACEPKT(B)
9	QIF_D2	QIF_D5	AMC1_DAT[1]	QIF_SYNC	QIF_D0				VDD_MAIN	VSS_MAIN	VDD_MAIN	VSS_MAIN							MEM_A[11]	MEM_A[4]	MEM_A[19]	PIPESTAT0
8	QIF_D6	QIF_D4	QIF_D3	QIF_D7	QIF_RESET1				VSS_MAIN	VDD_MAIN	VSS_MAIN								MEM_A[2]	MEM_A[3]	MEM_CAS_N	PIPESTAT0
7	VSSP_DNG	QIF_PCLK	QIF_RESET2	QIF_D3	QIF_D0														MEM_A[6]	MEM_A[7]	MEM_A[12]	MEM_RAS_N
6	QIF_PD	CLKOUT2	QIF_D1	DSPOUT1	MMQ2_CLK														MEM_CSA2_N	MEM_A[8]	MEM_A[10]	TOP_MEM_E
5	VDDP_XGB	QIF_D2	QIF_C0	QIF_D5	QIF_D0	QIF_D1	QIF_D0	QIF_D0	QIF_D0	MEM_CSA1_N	MEM_B2C_N	MEM_A[4]	MEM_A[9]									
4	QIF_SYNC	QIF_D7	QIF_H0	JSIF3_SCI4SIFI_CTS_N	QIF_D0	QIF_D0	DSPOIN	MEM_A[0]	MEM_A[0]	MEM_A[0]	MEM_A[1]	MEM_B2C_N	MEM_A[1]	MEM_A[9]								
3	QIF_D4	QIF_D6	QIF_HR	MMQ2_CMD	JSIF3_RXD_MIF1_RXD_MT	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	MEM_CSA0	MEM_B2C1_N	MEM_B2C1_N	MEM_B2C1_N
2	QIF_D5	VDDP_DNG0	QIF_D8	MMQ2_DAT0	JSIF3_RXD_MT	IRDA_RX	VSSP_DNG	QIF_D0	QIF_D0	MEM_WAIT_N	QIF_D0	QIF_D0	MEM_A[0]	MEM_A[0]	MEM_A[0]	MEM_A[0]	MEM_A[0]	MEM_A[0]	SP_MEM_E	MEM_A[19]	MEM_A[19]	MEM_SOCKET_N
1	CORNER_A	QIF_RD	QIF_CS1	QIF_YD	JSIF1_RXS_N	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0	QIF_D0
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	T	U	V	W	Y	AA	

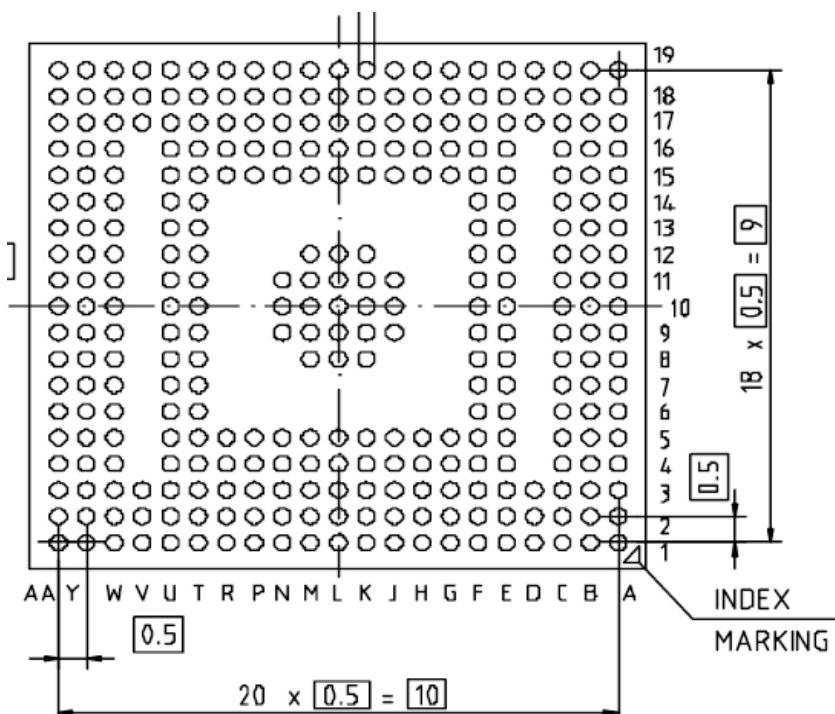
S-Gold 3 (PMB 8877) Package TOP View

Legend:

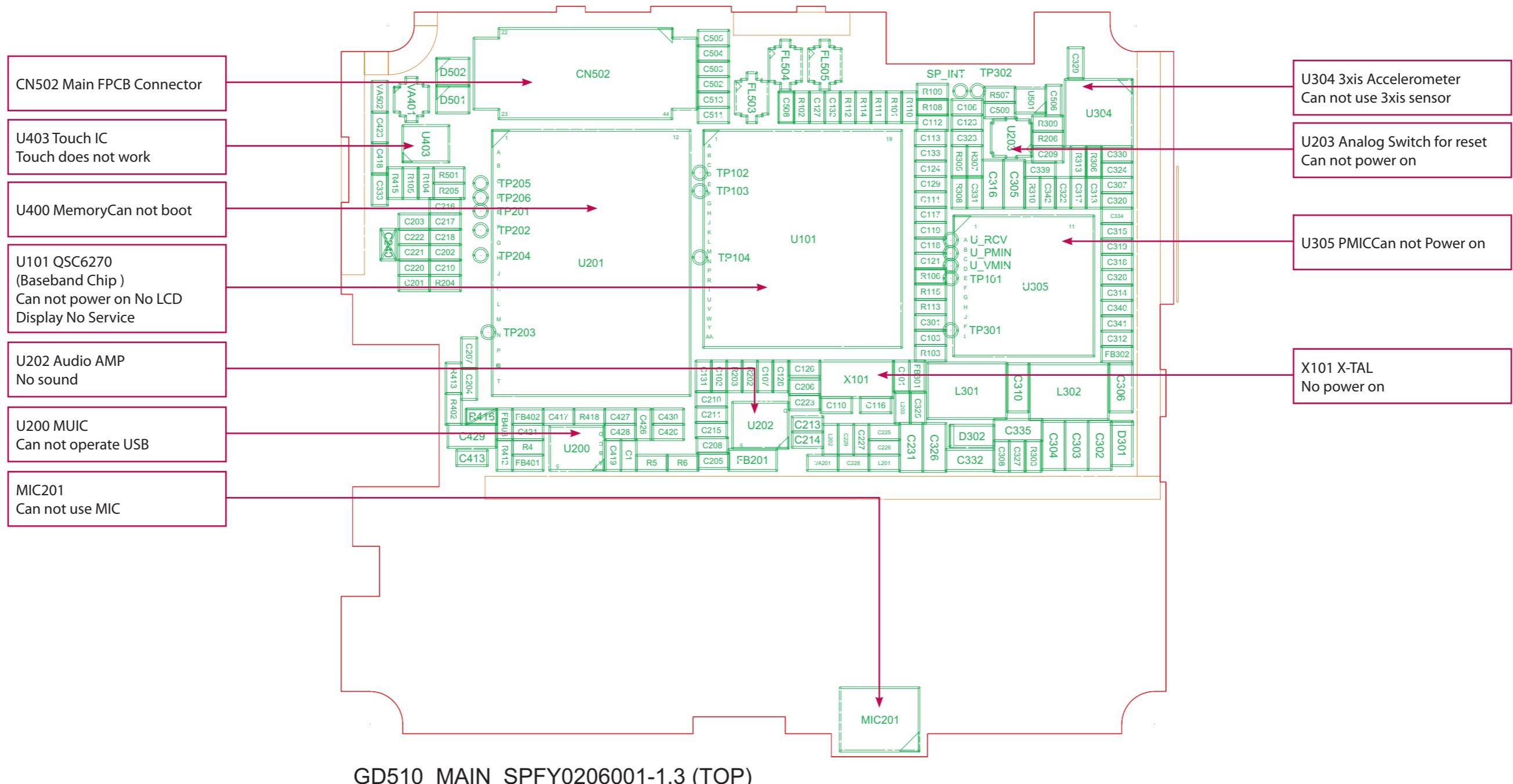
- [Green Box] No Ball (depopulated)
- [Pink Box] Ball not connected internally
- [Blue Box] Do not Connect - can be used for drop test

Notes:

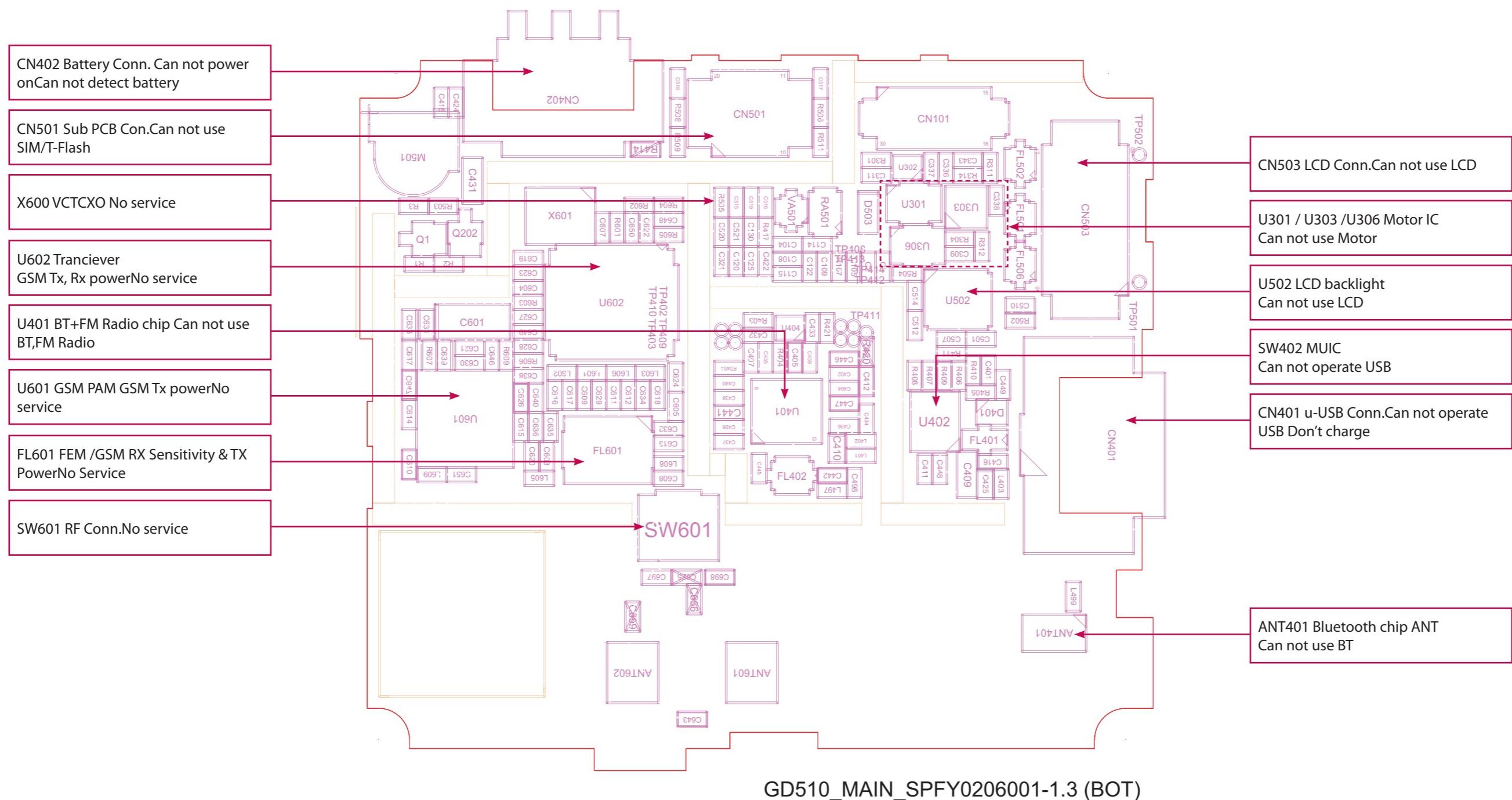
- All VSS balls are connected on the substrate, that is:
- VSS\_MAIN, VSS\_MEM\_ETM, VSSP\_DNG, VSS\_PLL, VSS\_RTC
- VSSA\_BB, VSSA\_BG, VSSA\_VBR, VSSA\_M, VSSA\_D



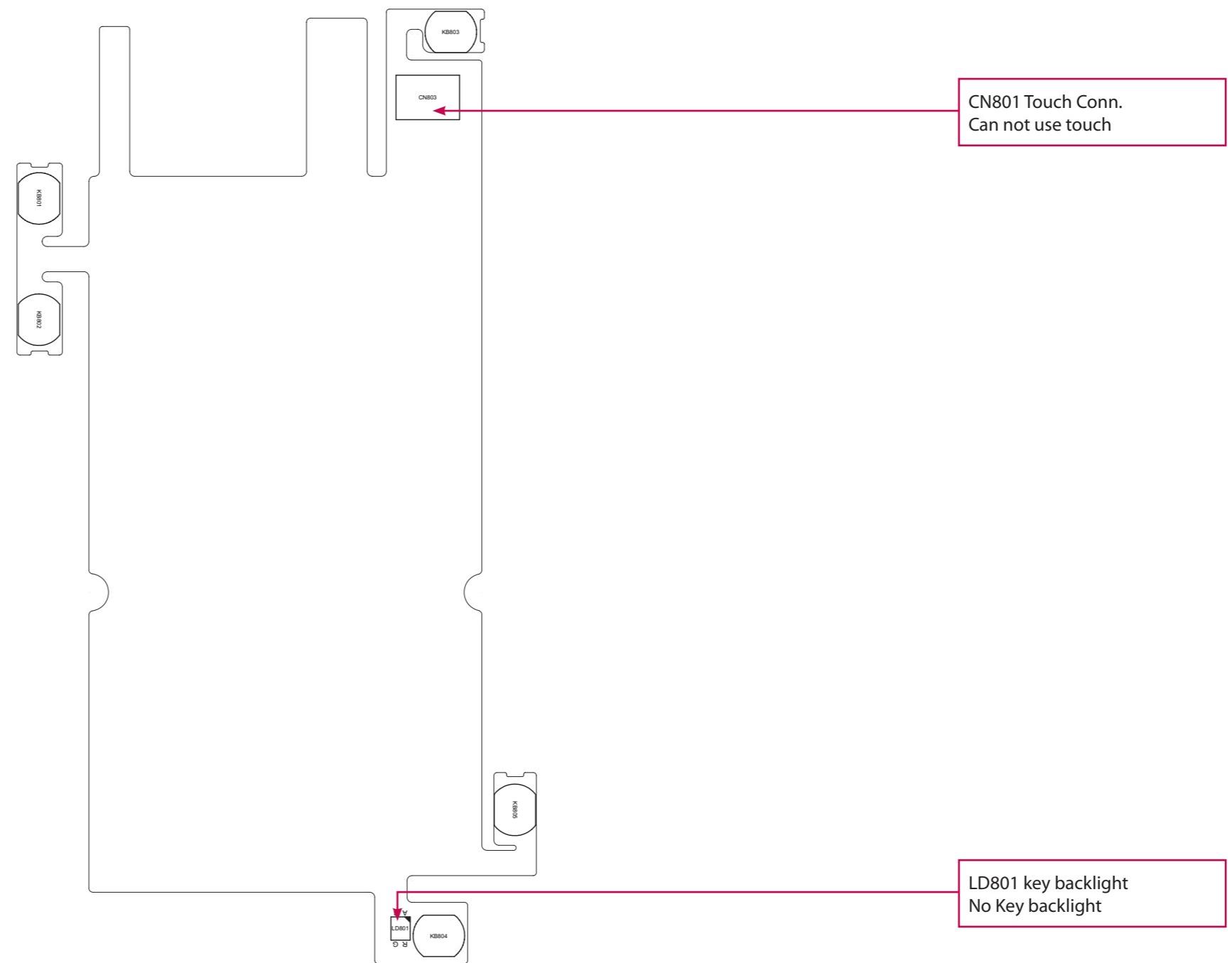
## 10. PCB LAYOUT



## 10. PCB LAYOUT

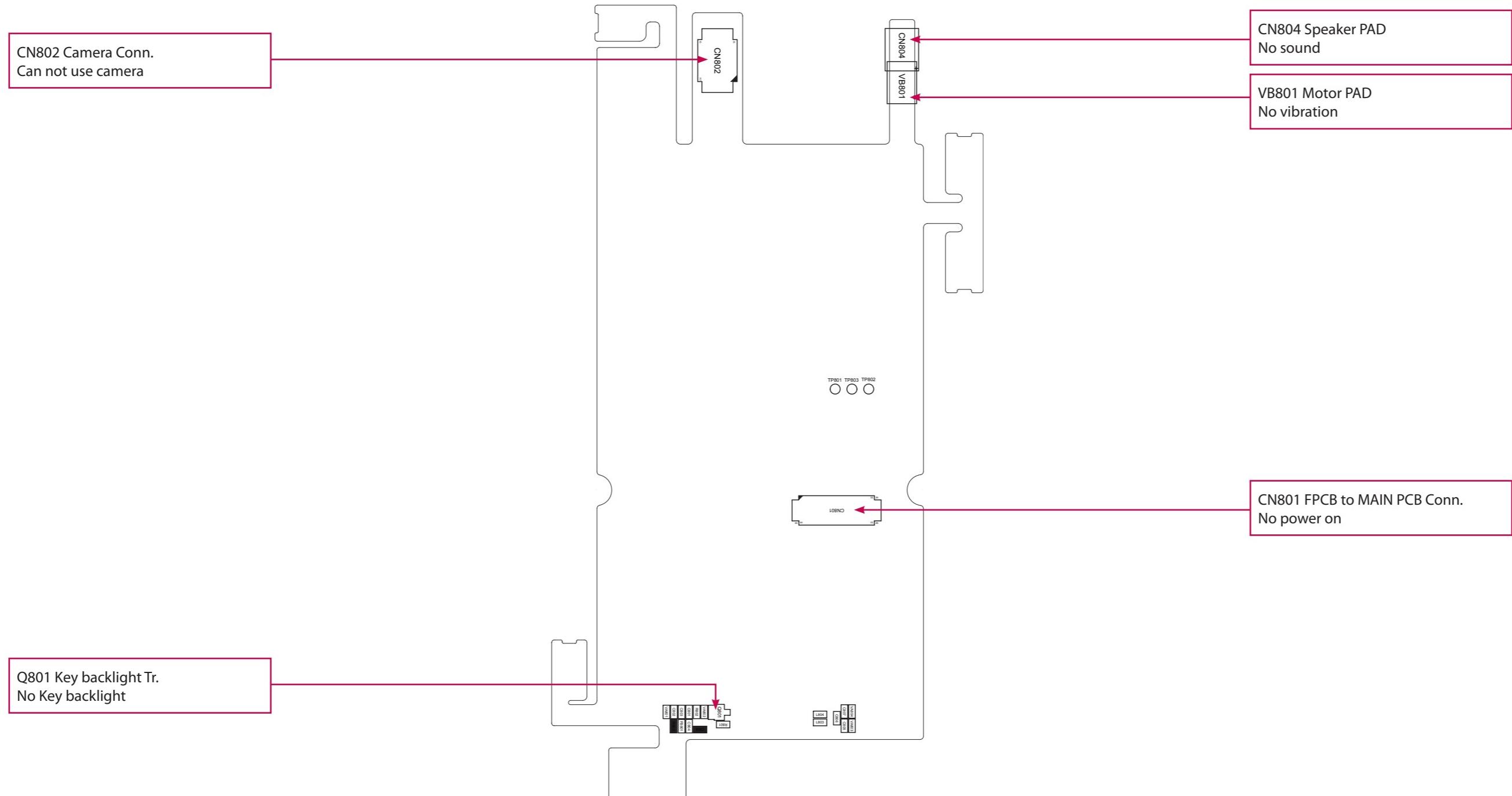


## 10. PCB LAYOUT



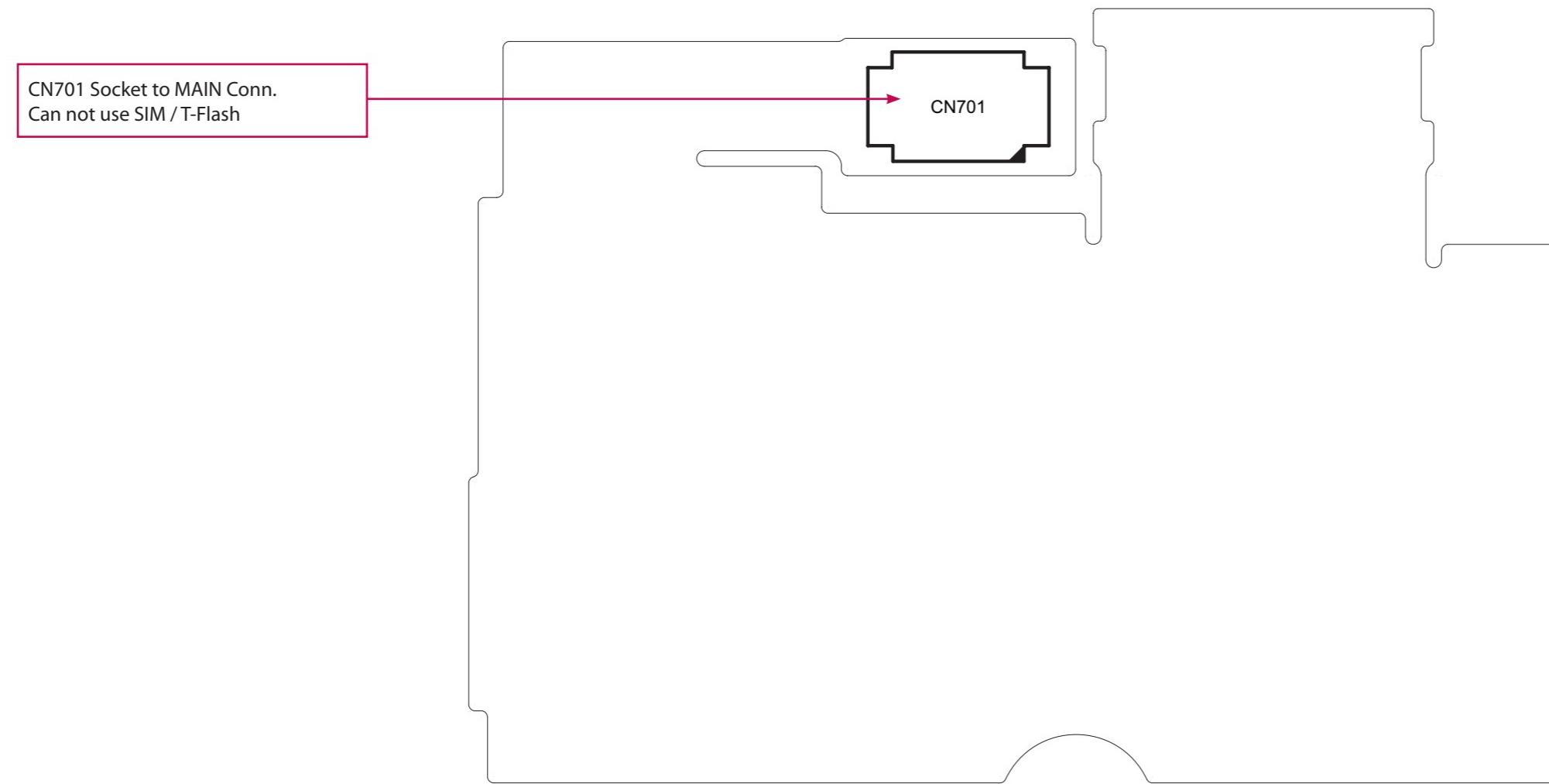
GD510\_F\_LCD\_SPCY0191201-1.1-TOP

## 10. PCB LAYOUT



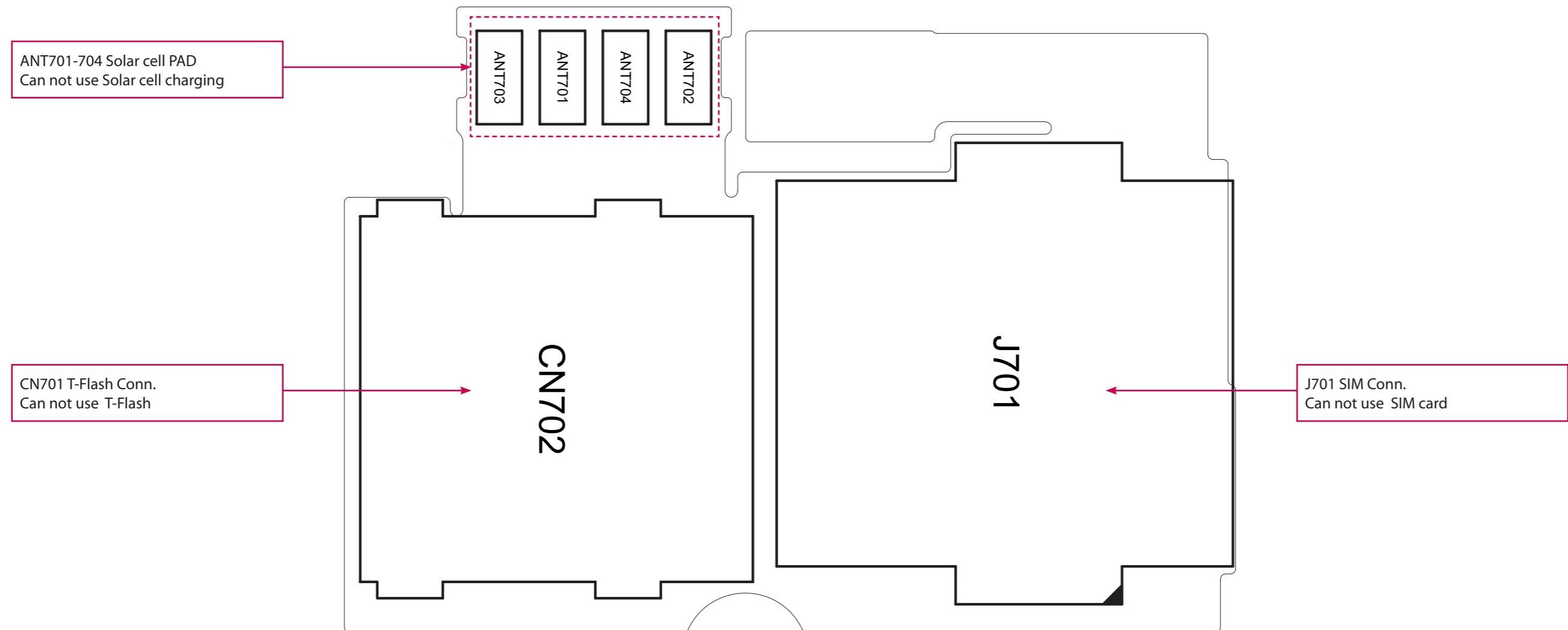
GD510\_F\_LCD\_SPCY0191201-1.1-BOT

## 10. PCB LAYOUT



GD510\_F\_SOCKET\_SPCY0191301-1.2-TOP

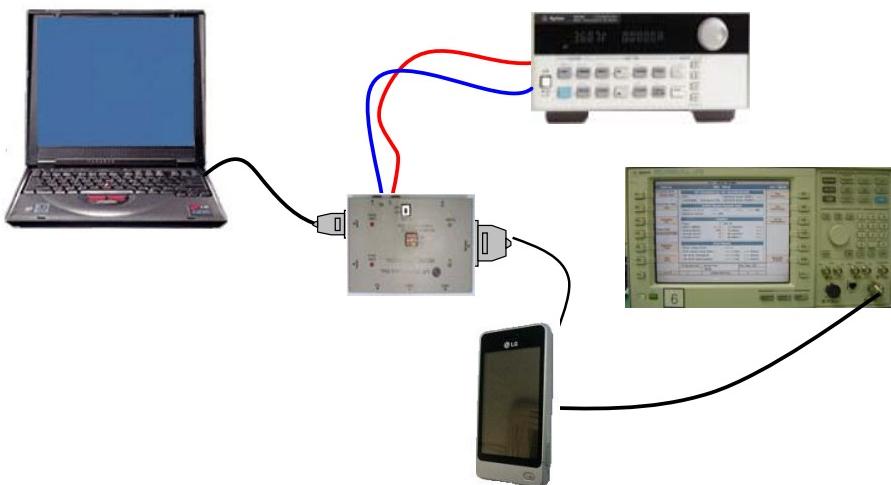
## 10. PCB LAYOUT



GD510\_F\_SOCKET\_SPCY0191301-1.2-BOT

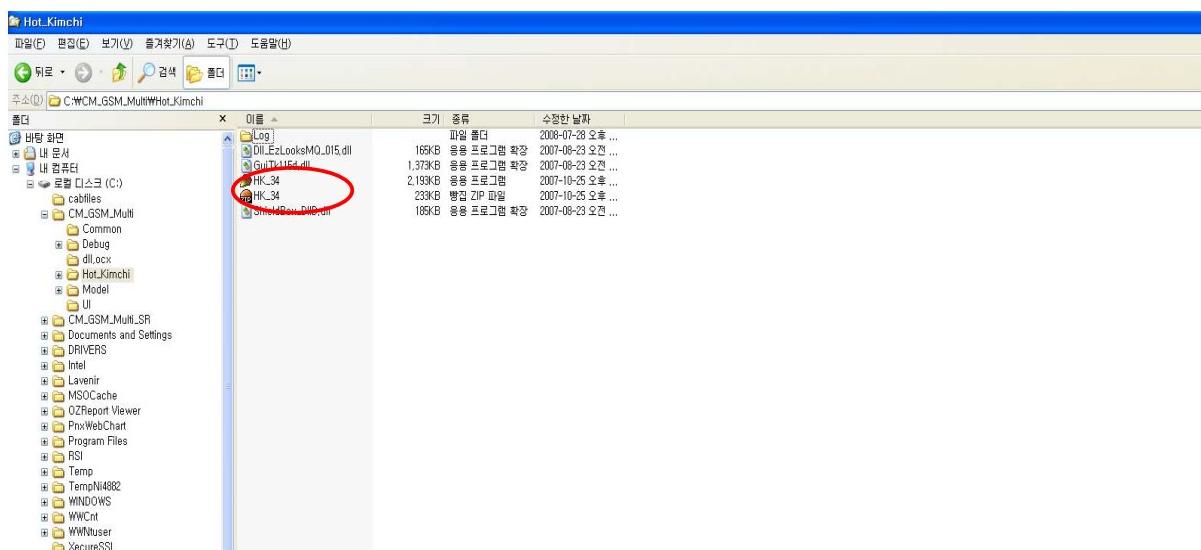
# 11. RF Calibration

## 11.1. Test Equipment Setup



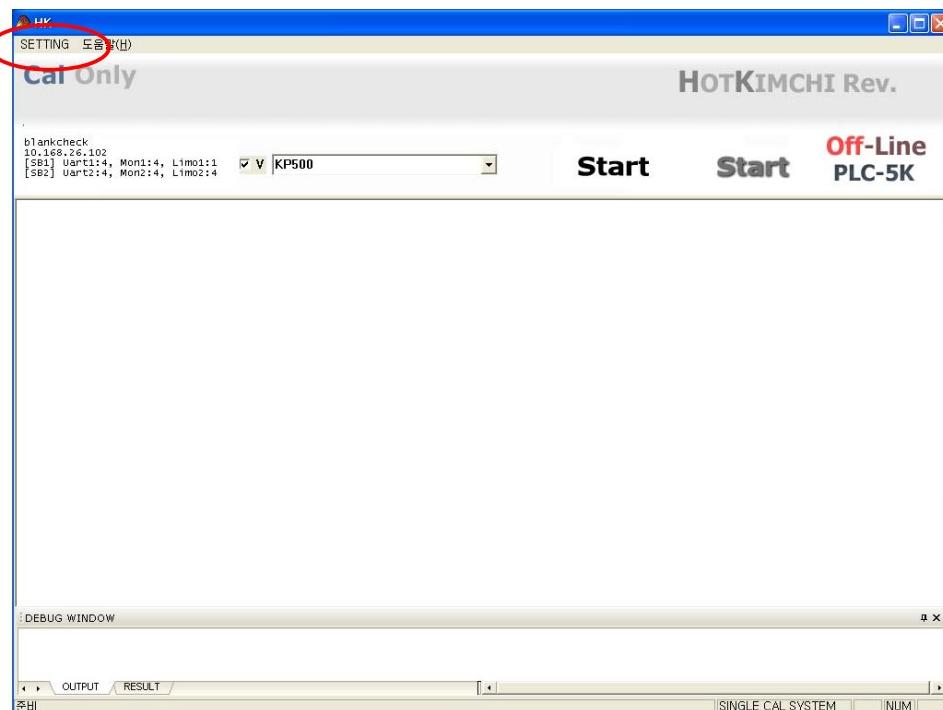
## 11.2. Calibration Step

- 2.1. Turn on the Phone.
- 2.2. Execute “ HK\_34.exe”

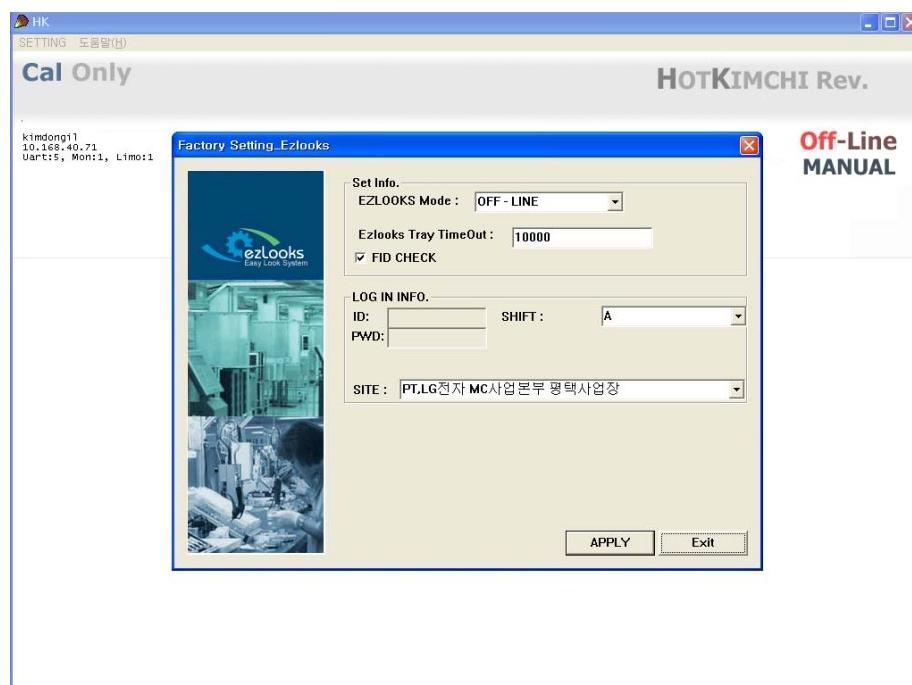


## 11. RF Calibration

2.3. Click “ SETTING ” Menu

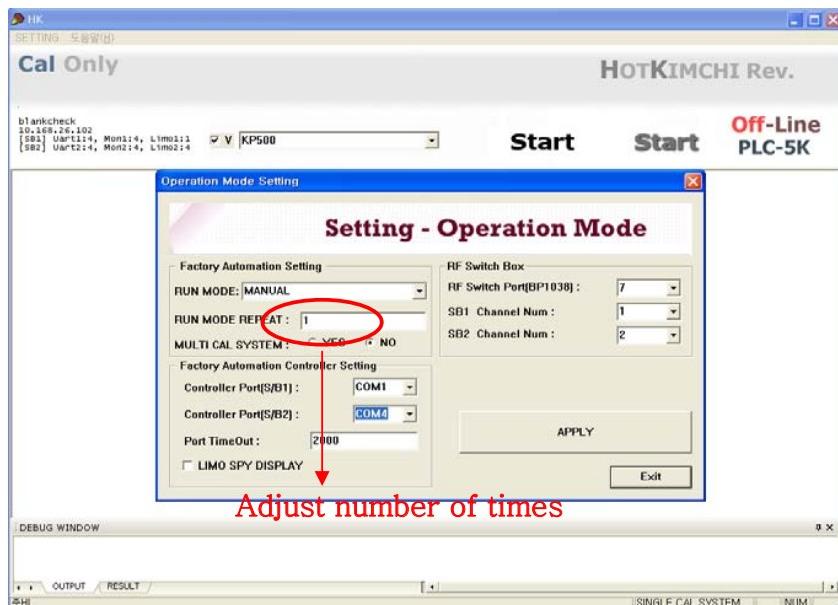


2.4. Setup “ Ezlooks ” menu such as the following figure

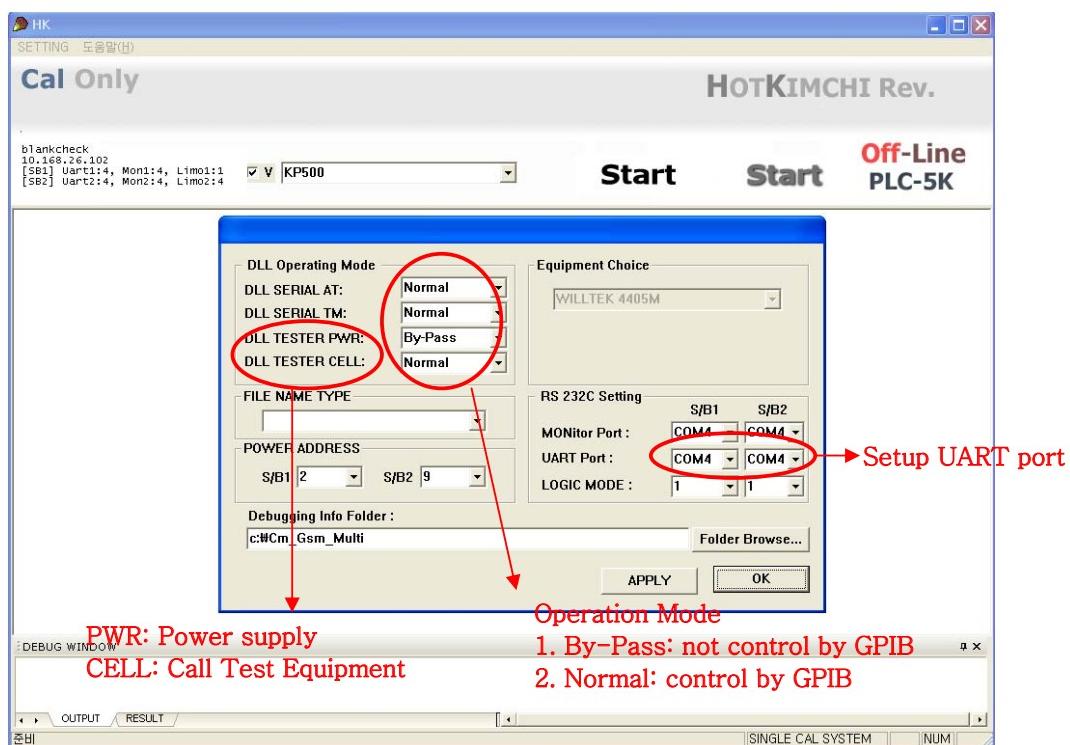


## 11. RF Calibration

2.5. Setup “ Line System” menu such as the following figure



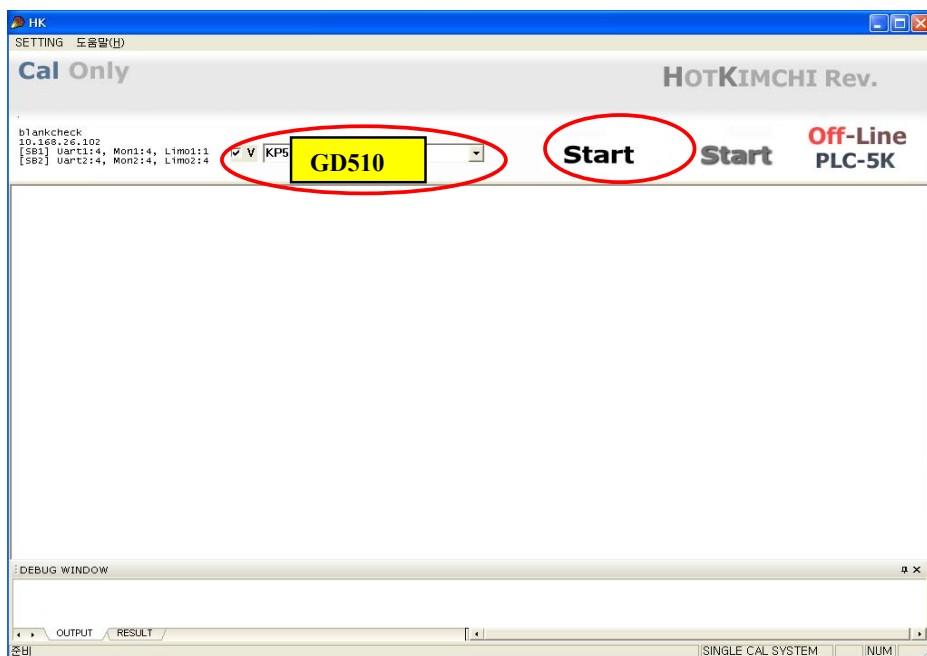
2.6. Setup Logic operation such as the following figure.



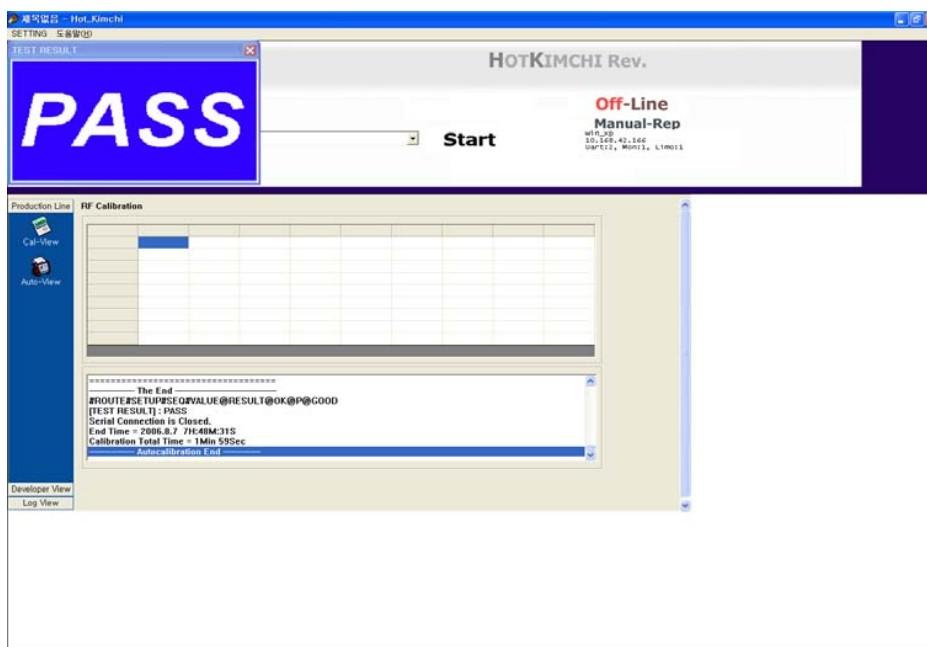
## 11. RF Calibration

2.7. Select “ MODEL ” .

2.8. Click “ START ” for RF calibration

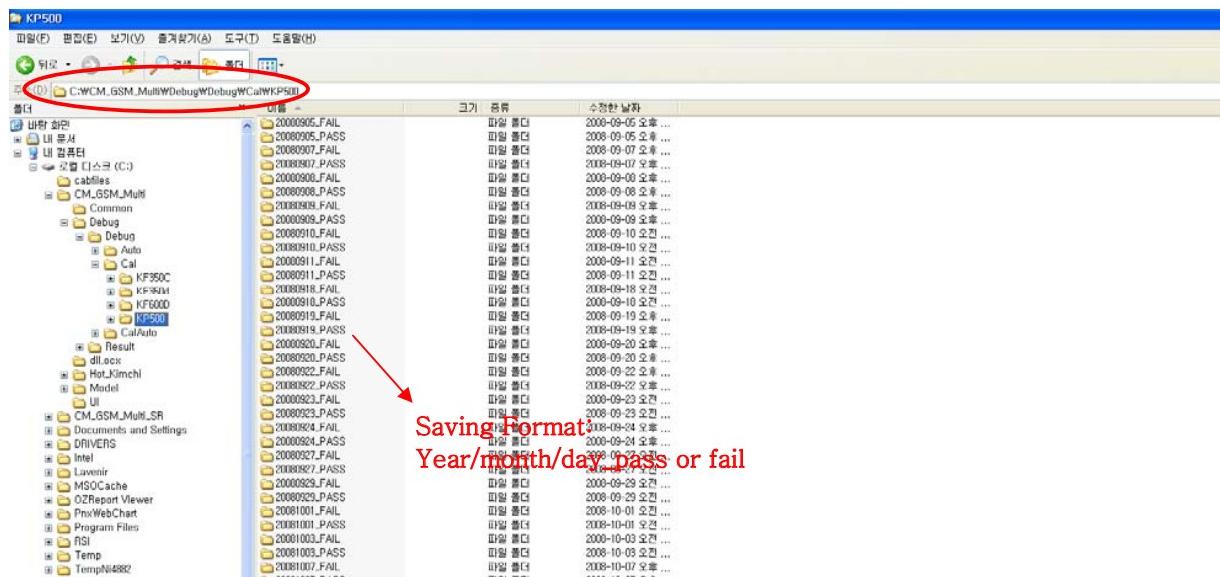


2.9. RF Calibration finishes.



## 11. RF Calibration

2.10. Calibration data will be saved to the following folder.



### Notices:

1. The state of Phone is “ test mode ” during the CALIBRATION.
2. Calibration program automatically changes either “ normal mode ” or “ ptest mode ” .
3. RF Calibration steps as follow:  
TX Channel compensation: EGSM->GSM850->DCS->PCS->EDGE EGSM->EDGE  
GSM850->EDGE DCS->EDGE PCS  
RX Channel compensation: EGSM->GSM850->DCS->PCS
4. Phone Operation Mode



< Normal Mode >



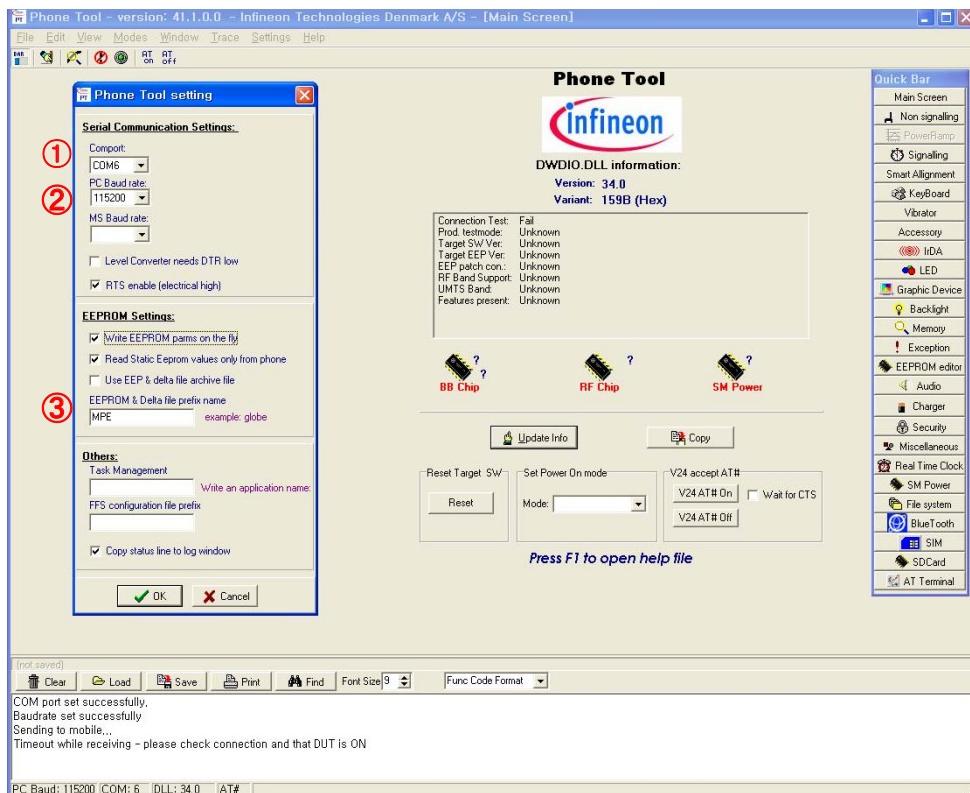
< Ptest Mode>

## 12. Stand-alone Test

# 12. Stand-alone Test

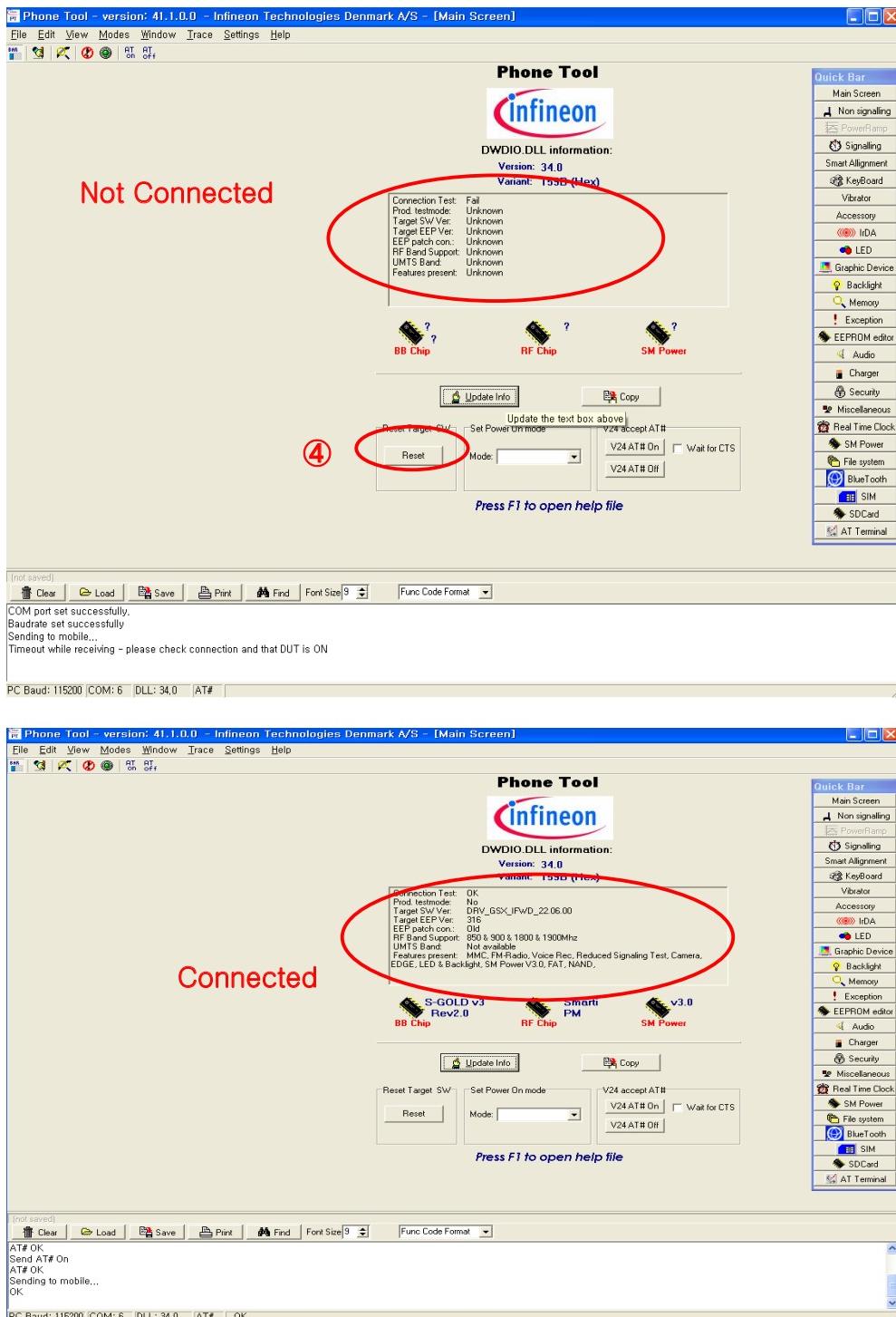
### 12.1. Test Program Setting

- ① Set COM Port.
- ② Check PC Baud rate.
- ③ Confirm EEPROM & Delta file prefix name.



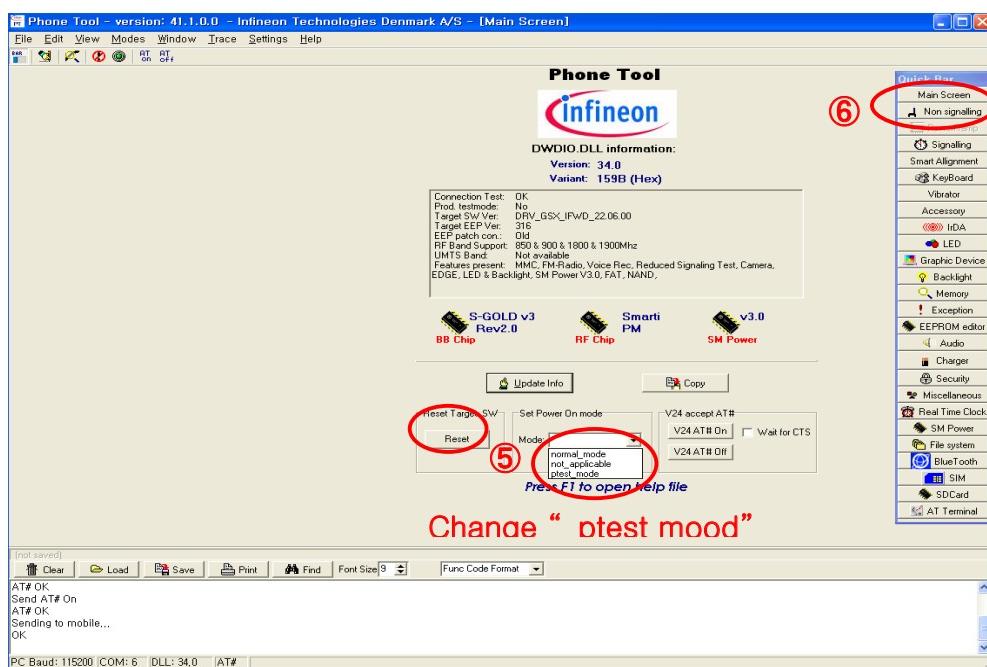
## 12. Stand-alone Test

④Click “ Update Info ” for communicating Phone and Test–Program.



## 12. Stand-alone Test

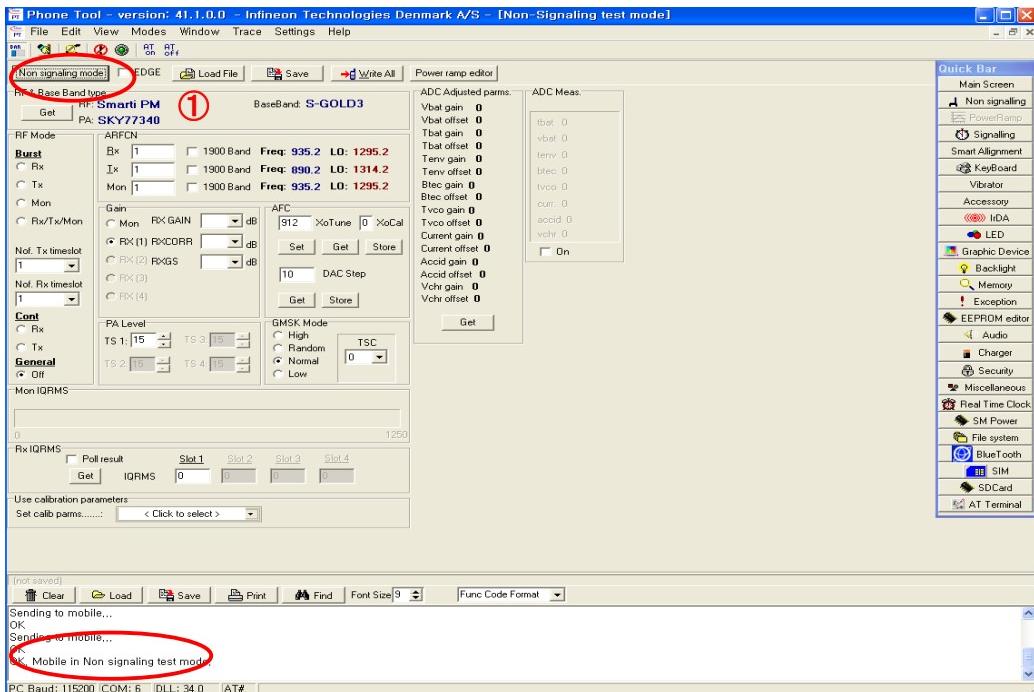
- ⑤For the purpose of the Standalone Test, Change the Phone to “ ptest mode” and then Click the “ Reset” bar.  
⑥Select “ Non signaling” in the Quick Bar menu. Then Standalone Test setup is finished.



## 12. Stand-alone Test

### 12.2.Tx Test

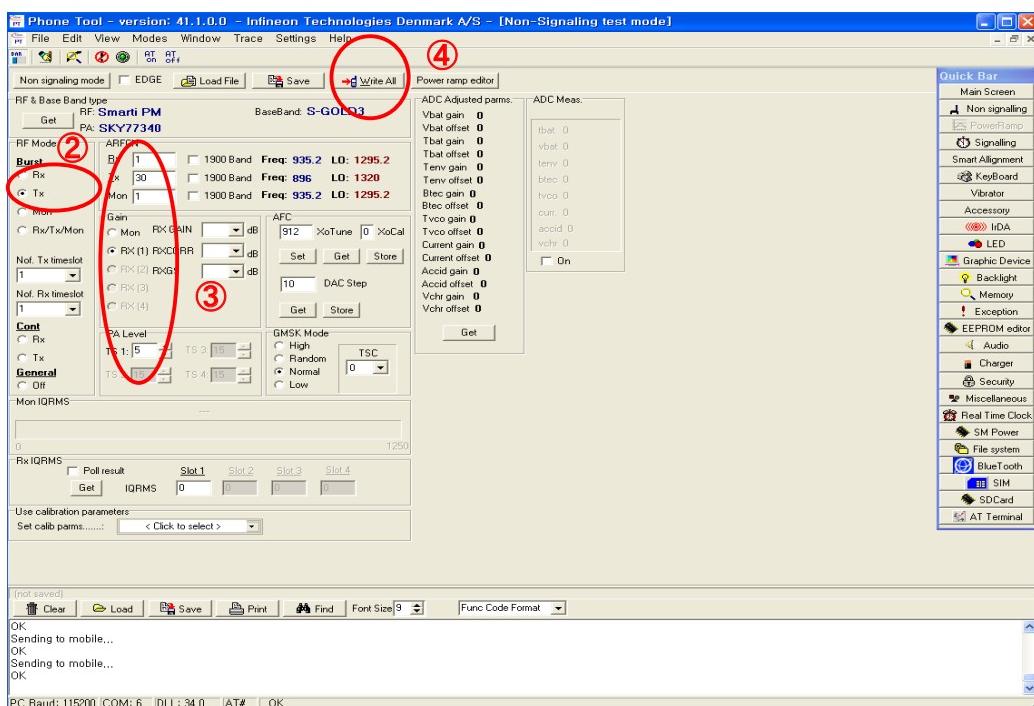
① Click “ Non signaling mode” bar and then confirm “ OK” text in the command line.



② Put the number of TX Channel in the ARFCN.

③ Select “ Tx” in the RF mode menu and “ PCL” in the PA Level menu.

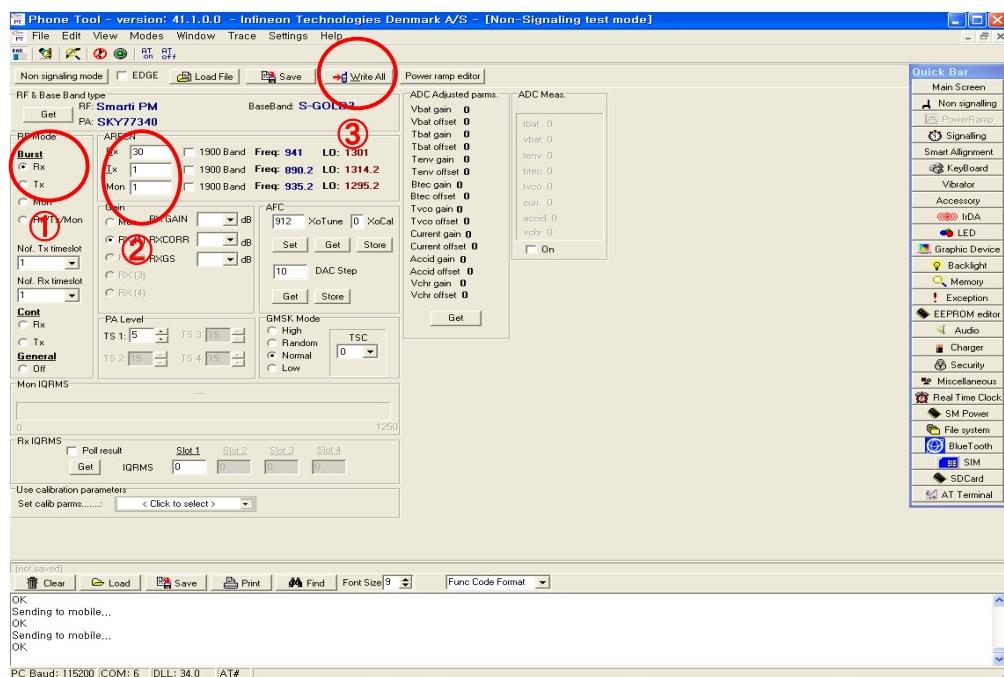
④ Finally, Click “ Write All” bar and try the efficiency test of Phone.



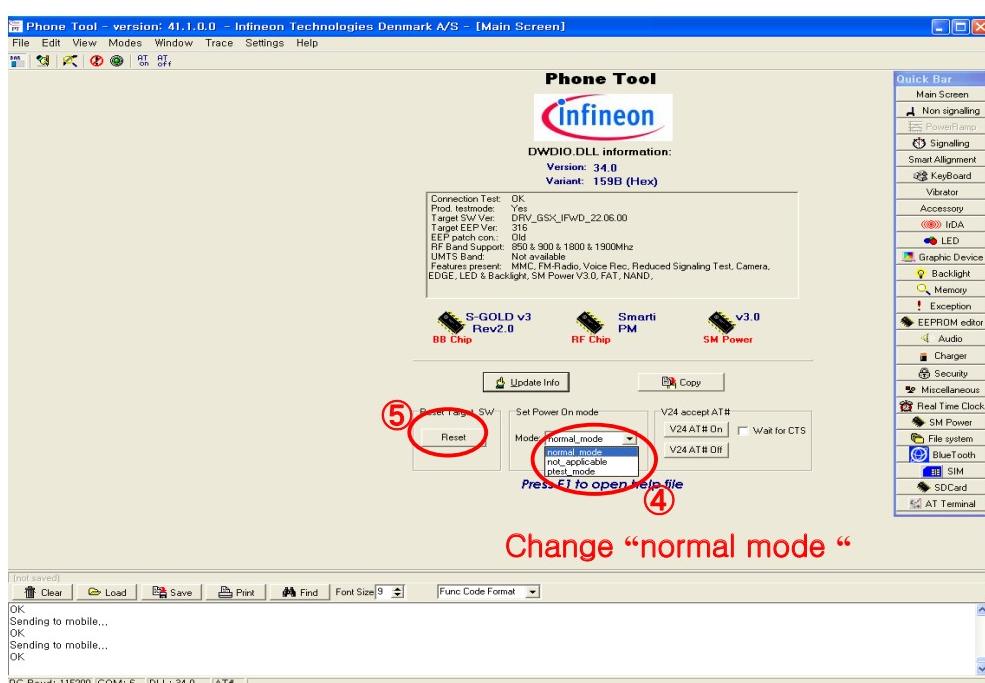
## 12. Stand-alone Test

### 12.3.Rx Test

- ① Put the number of RX Channel in the ARFCN.
- ② Select “ Rx ” in the RF mode menu.
- ③ Finally, Click “ Write All ” bar and try the efficiency test of Phone.

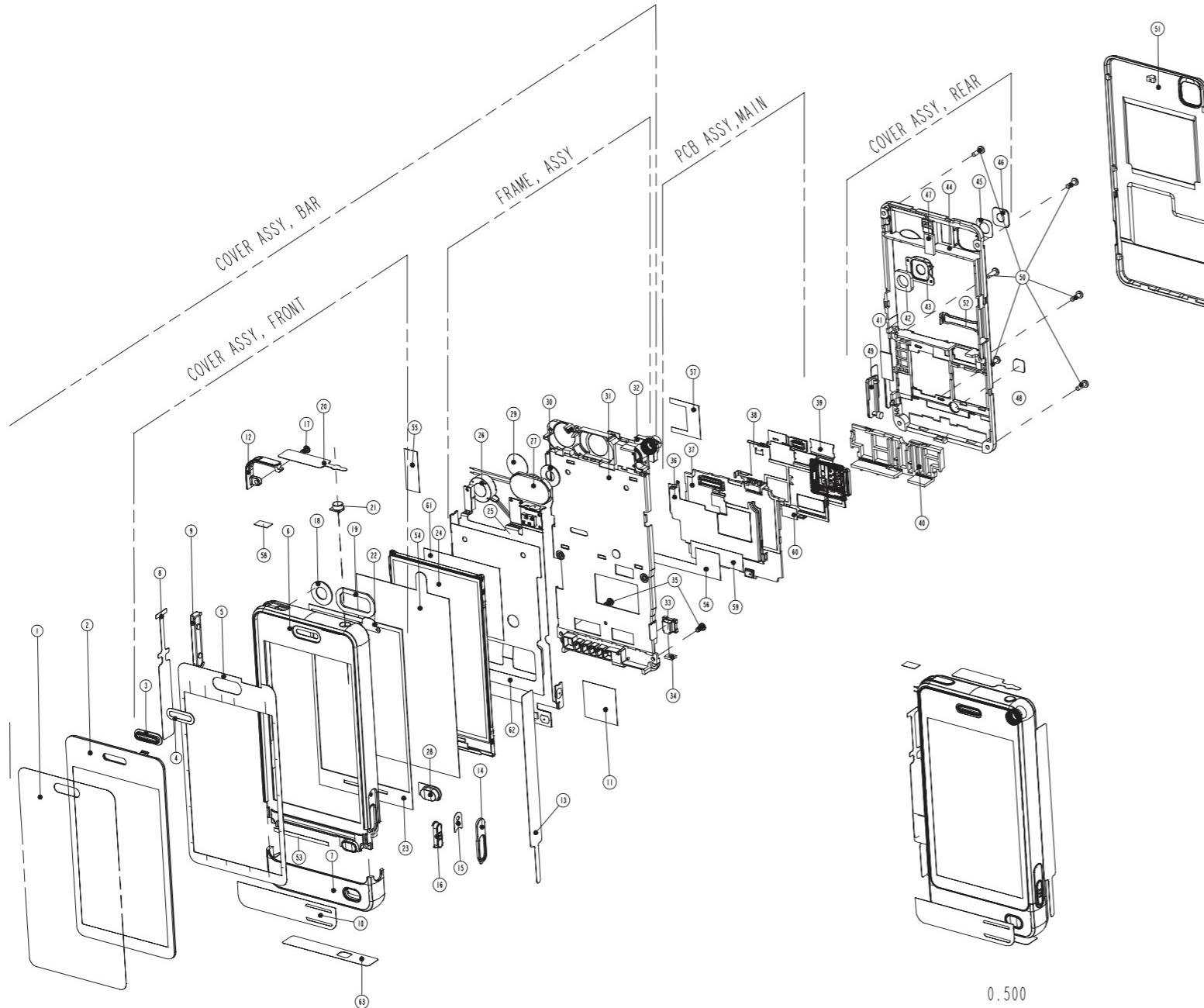


- ④ The Phone must be changed “ normal mode ” after finishing Test.
- ⑤ Change the Phone to “ normal mode ” and then Click the “ Reset ” bar. W



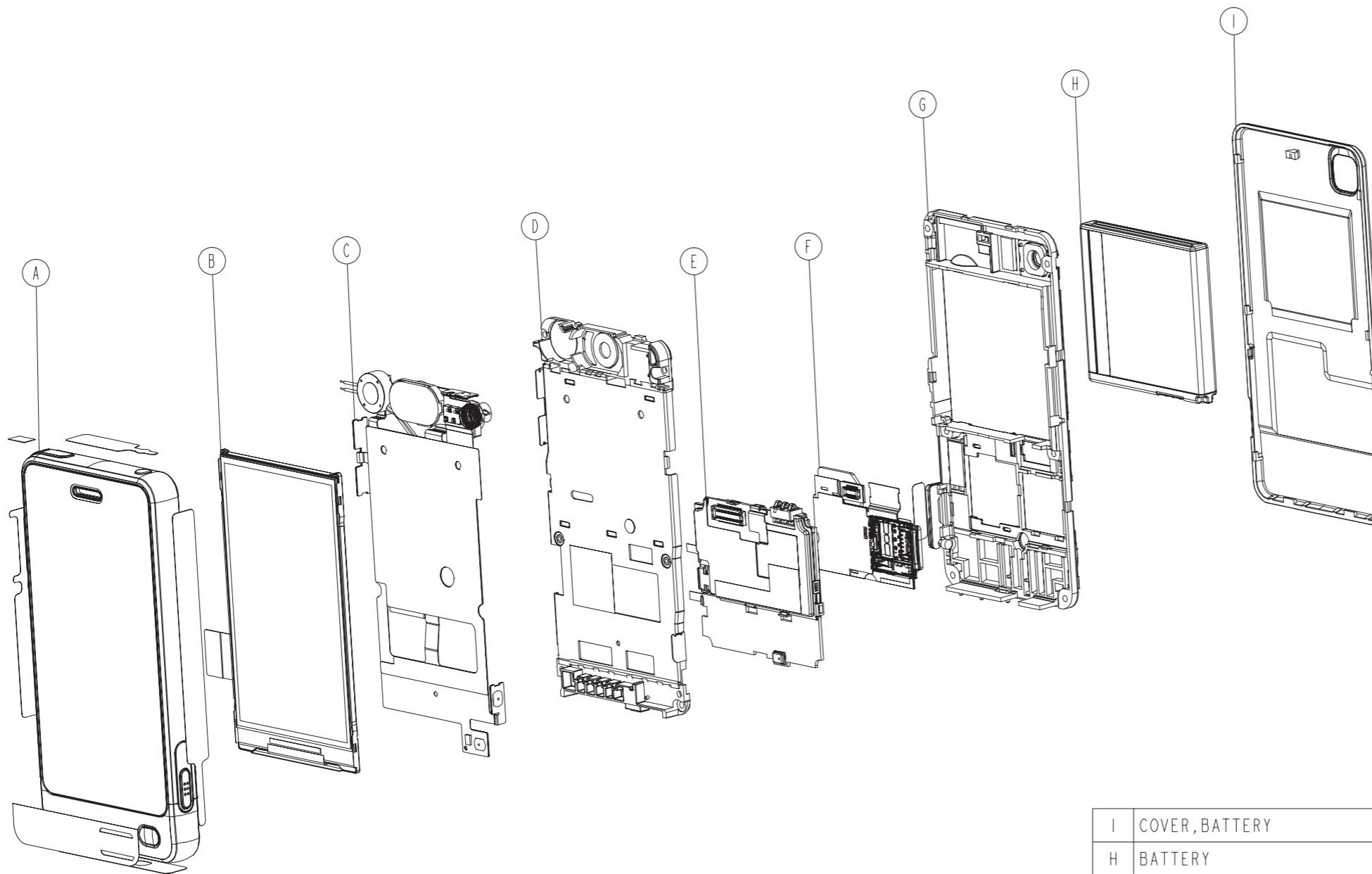
## 13. EXPLODED VIEW & REPLACEMENT PART LIST

### 13.1 EXPLODED VIEW



No	Part Name	Part Number	Q'ty	Remark
63	TAPE,PROTECTION	MTAB033890I	I	Deco,Front
62	GASKET	MGAZ008550I	I	Main Fpcb 0.1T
61	GASKET	MGAZ008540I	I	30mm*35mm 0.05T
60	ABSORBER	MAAA000380I	I	
59	INSULATOR	MIDZ023740I	I	Short prevention
58	TAPE,DECO	MTAA020850I	I	HandStrap
57	INSULATOR	MIDZ023120I	I	MAIN PCB USB
56	GASKET	MGAZ007690I	I	
55	INSULATOR	MIDZ023080I	I	
54	INSULATOR	MIDZ023290I	I	LCDPAD
53	TAPE,HEAT RADIATION	MTAH00070I	I	
52	PLATE,GROUND	MPFD000820I	I	
51	COVER,BATTERY	MCJA009520I	I	
50	SCREW MACHINE	GMEY0007902	6	M1.4 * 4.5mm
49	CAP,RECEPTACLE	MCCE005340I	I	
48	SHHEET	MSAZ005700I	I	RF Mobile SHEET
47	PAD,CONNECTOR	MPBU007740I	I	Camera Conn.
46	WINDOW,CAMERA	MWAE005100I	I	
45	TAPE,WINDOW	MTAD011250I	I	
44	COVER,REAR	MCJN010730I	I	
43	DECO,CAMERA	MDAD004950I	I	
42	PAD,CAMERA	MPBT008090I	I	
41	PAD,CONNECTOR	MPBU007750I	I	LCD Conn.
40	INTENNA	H/W	I	
39	PCB ASSY,FLEXIBLE	H/W	I	Sub Fpcb
38	CAN,SHIELD	MCBA005610I	I	Sub
37	PCB MAIN	H/W	I	
36	CAN,SHIELD	MCBA005600I	I	Main
35	SCREW MACHINE	GMEY000920I	2	
34	PAD,MIKE	MPBH005140I	I	Mesh
33	FILTER,MIKE	MFBD004100I	I	Rubber
32	CAMERA	H/W	I	
31	FRAME	MFEZ002090I	I	
30	PAD,RECEIVER	MPBM003230I	I	
29	TAPE,MOTOR	MTAF003060I	I	
28	BUTTON ASSY,MAIN	ABGF001860I	I	Home Key
27	SPEAKER	H/W	I	
26	VIBRATOR,MOTOR	H/W	I	
25	PCB ASSY,FLEXIBLE	H/W	I	Main Fpcb
24	LCD,MODULE	H/W	I	3inch
23	PAD,LCD	MPBG009740I	I	
22	TAPE,FLEXIBLE PCB	MTAJ002370I	I	
21	BUTTON,SIDE	MBJL009680I	I	Power Key
20	TAPE,PROTECTION	MTAB033070I	I	Power Key
19	PAD,SPEAKER	MPBN007690I	I	
18	PAD,MOTOR	MPB006810I	I	
17	SCREW,MACHINE	GMEY000920I	I	M1.4 * 3.5mm
16	BUTTON,SIDE	MBJL009700I	I	Camera Key
15	TAPE,DECO	MTAA020090I	I	
14	DECO,SIDE	MDAC002830I	I	Cam Key Deco
13	TAPE,PROTECTION	MTAB033080I	I	Camera Key
12	HANDSTRAP	MHBY000920I	I	
11	GASKET	MGAZ008590I	I	15mm*15mm 0.05T
10	TAPE,PROTECTION	MTAB033100I	I	Home Key
9	BUTTON,SIDE	MBJL009690I	I	Volume Key
8	TAPE,PROTECTION	MTAB033120I	I	Volume Key
7	DECO, FRONT	MDAG005360I	I	
6	COVER, FRONT	MCJK011170I	I	
5	TAPE,WINDOW	MTAD011240I	I	
4	FILTER,SPEAKER	MFBC005400I	I	
3	DECO,SPEAKER	MDAN001820I	I	
2	WINDOW,LCD	MWAC012560I	I	
1	TAPE,PROTECTION	MTAB033060I	I	

## ASS'Y EXPLODED VIEW



No	Part Name	Part Number	Q'ty	Remark
I	COVER,BATTERY	MCJA009520I	I	
H	BATTERY	-	I	
G	COVER ASSY, REAR	ACGM013930I	I	
F	PCB ASSY,FLEXIBLE	SACY010090I	I	
E	PCB ASSY,MAIN	SAFY033750I	I	
D	FRAME ASSY	AFBZ001380I	I	
C	PCB ASSY,FLEXIBLE	SACY010080I	I	
B	LCD MODULE	SVLM003520I	I	
A	COVER ASSY, FRONT	ACGK014160I	I	

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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### 13.2 Replacement Parts <Mechanic component>

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Color	Remark
2	AAAY00	ADDITION	AAAY0397301		SILVER	
3	MCJA00	COVER,BATTERY	MCJA0095201	MOLD, PC LUPOY SC-1004A, , , ,	SILVER GRAY	I, 51
3	MMBB00	MANUAL,OPERATION	MMBB0356702	PRINTING, (empty), , , ,	WITHOUT COLOR	
2	APAY00	PACKAGE	APAY0137304	GD510 UK (TR1-1HL/UK_UB/500ea)Packing	WITHOUT COLOR	
3	APLY00	PALLET ASSY	APLY0003201	TDR TR1-1 STD Palletizing	Without Color	
4	MPBZ00	PAD	MPBZ0219601	COMPLEX, (empty), , 503, 860, 145,	Without Color	
4	MPCY00	PALLET	MPCY0013203	COMPLEX, (empty), , , ,	BLUE	
3	MBAD00	BAG,VINYL(PE)	MBAD0005204	COMPLEX, (empty), , , ,	WITHOUT COLOR	
3	MLAC00	LABEL,BARCODE	MLAC0004541	PRINTING, (empty), , , ,	Without Color	
3	MLAZ01	LABEL	MLAZ0050901	PRINTING, (empty), , , ,	WITHOUT COLOR	
2	APEY	PHONE	APEY0819601		SILVER	
3	ACGM00	COVER ASSY,REAR	ACGM0139301		SILVER	G
4	MCCE00	CAP,RECEPTACLE	MCCE0053401	COMPLEX, (empty), , , ,	SILVER	49
4	MCJN00	COVER,REAR	MCJN0107301	MOLD, PC LUPOY SC-1004A, , , ,	SILVER GRAY	44
4	MDAD00	DECO,CAMERA	MDAD0049501	ELECTROFORMING, Ni, , , ,	TITAN GRAY	43
4	MPBT00	PAD,CAMERA	MPBT0080901	COMPLEX, (empty), , , ,	WITHOUT COLOR	42
4	MPBU00	PAD,CONNECTOR	MPBU0077401	COMPLEX, (empty), , , ,	WITHOUT COLOR	47
4	MPBU01	PAD,CONNECTOR	MPBU0077501	COMPLEX, (empty), , , ,	WITHOUT COLOR	41
4	MSAZ00	SHEET	MSAZ0057001	COMPLEX, (empty), , , ,	BLACK	48
4	MTAB00	TAPE,PROTECTION	MTAB0373001	COMPLEX, (empty), , , ,	BLUE	
4	MTAD00	TAPE,WINDOW	MTAD0112501	COMPLEX, (empty), , , ,	WITHOUT COLOR	45
4	MWAE00	WINDOW,CAMERA	MWAE0051001	CUTTING, PMMA MR 200, , , ,	BLACK	46
3	ACGV00	COVER ASSY,BAR	ACGV0009401		SILVER	

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
4	ACGK00	COVER ASSY,FRONT	ACGK0141601		SILVER	A
5	ABGF00	BUTTON ASSY,MAIN	ABGF0018601	HOME KEY	SILVER	28
5	GMEY00	SCREW MACHINE,BIND	GMEY0009201	1.4 mm,3.5 mm,MSWR3(BK) ,B ,+ ,HEAD D=2.7mm	Black	17
5	MBJL01	BUTTON,SIDE	MBJL0096801	COMPLEX, (empty), , , ,	SILVER	21
5	MBJL02	BUTTON,SIDE	MBJL0096901	COMPLEX, (empty), , , ,	TITAN GRAY	9
5	MBJL03	BUTTON,SIDE	MBJL0097001	COMPLEX, (empty), , , ,	SILVER	16
5	MCJK00	COVER,FRONT	MCJK0111701	CASTING, Mg Alloy, , , ,	SILVER	6
5	MDAC00	DECO,SIDE	MDAC0028301	MOLD, PC LUPOY SC-1004A, , , ,	TITAN GRAY	14
5	MDAG00	DECO,FRONT	MDAG0053601	MOLD, Tempered Glass, , , ,	SILVER	7
5	MDAN00	DECO,SPEAKER	MDAN0018201	MOLD, PC LUPOY SC-1004A, , , ,	BLACK	3
5	MFBC00	FILTER,SPEAKER	MFBC0054001	COMPLEX, (empty), , , ,	WITHOUT COLOR	4
5	MPBG00	PAD,LCD	MPBG0097401	COMPLEX, (empty), , , ,	WITHOUT COLOR	23
5	MPBJ00	PAD,MOTOR	MPBJ0068101	COMPLEX, (empty), , , ,	WITHOUT COLOR	18
5	MPBN00	PAD,SPEAKER	MPBN0076901	COMPLEX, (empty), , , ,	WITHOUT COLOR	19
5	MTAA00	TAPE,DECO	MTAA0200901	COMPLEX, (empty), , , ,	WITHOUT COLOR	15
5	MTAA01	TAPE,DECO	MTAA0208501	COMPLEX, (empty), , , ,	WITHOUT COLOR	58
5	MTAB00	TAPE,PROTECTION	MTAB0330701	COMPLEX, (empty), , , ,	WITHOUT COLOR	20
5	MTAB01	TAPE,PROTECTION	MTAB0330801	COMPLEX, (empty), , , ,	WITHOUT COLOR	13
5	MTAB02	TAPE,PROTECTION	MTAB0331001	COMPLEX, (empty), , , ,	WITHOUT COLOR	10
5	MTAB03	TAPE,PROTECTION	MTAB0331201	COMPLEX, (empty), , , ,	WITHOUT COLOR	8
5	MTAB04	TAPE,PROTECTION	MTAB0338901	COMPLEX, (empty), , , ,	WITHOUT COLOR	63
5	MTAD00	TAPE,WINDOW	MTAD0112401	COMPLEX, (empty), , , ,	WITHOUT COLOR	5
5	MTAH00	TAPE,HEAT RADIATION	MTAH0000701	COMPLEX, (empty), , , ,	WITHOUT COLOR	53
5	MTAJ00	TAPE,FLEXIBLE PCB	MTAJ0023701	COMPLEX, (empty), , , ,	WITHOUT COLOR	22
4	AFBZ00	FRAME ASSY	AFBZ0013801		BLACK	D

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
5	MFBDO0	FILTER,MIKE	MFBDO041001	MOLD, Urethane Rubber S185A, , , ,	BLACK	33
5	MFEZ00	FRAME	MFEZ0020901	COMPLEX, (empty), , , ,	BLACK	31
6	MBFZ00	BRACKET	MBFZ0044601	PRESS, STS, , , ,	WITHOUT COLOR	
5	MIDZ00	INSULATOR	MIDZ0231001	COMPLEX, (empty), , , ,	BLUE	
5	MLAB	LABEL,A/S	MLAB0001102	C2000 USASV DIA 4.0	WHITE	
5	MPBH00	PAD,MIKE	MPBH0051401	COMPLEX, (empty), , , ,	BLACK	34
5	MPBM00	PAD,RECEIVER	MPBM0032301	COMPLEX, (empty), , , ,	BLACK	30
5	MTAF00	TAPE,MOTOR	MTAF0030601	COMPLEX, (empty), , , ,	WITHOUT COLOR	29
4	GMEY00	SCREW MACHINE,BIND	GMEY0009201	1.4 mm,3.5 mm,MSWR3(BK) ,B ,+ ,HEAD D=2.7mm	Black	35
4	MGAZ00	GASKET	MGAZ0085401	COMPLEX, (empty), , , ,	GOLD	61
4	MGAZ01	GASKET	MGAZ0085501	COMPLEX, (empty), , , ,	GOLD	62
4	MGAZ02	GASKET	MGAZ0085901	COMPLEX, (empty), , , ,	GOLD	11
4	MIDZ00	INSULATOR	MIDZ0230801	COMPLEX, (empty), , , ,	BLACK	55
4	MIDZ01	INSULATOR	MIDZ0232901	COMPLEX, (empty), , , ,	WITHOUT COLOR	54
4	MIDZ02	INSULATOR	MIDZ0242501	COMPLEX, (empty), , , ,	WITHOUT COLOR	
4	MPBG00	PAD,LCD	MPBG0105301	COMPLEX, (empty), , , ,	BLACK	
4	MTAB00	TAPE,PROTECTION	MTAB0330601	COMPLEX, (empty), , , ,	WITHOUT COLOR	1
4	MWAC00	WINDOW,LCD	MWAC0125601	CUTTING, Tempered Glass, , , ,	BLACK	2
3	GMEY00	SCREW MACHINE,BIND	GMEY0007902	1.4 mm,4.5 mm,MSWR3 ,A ,ETC , ; ,CS ,+ ,2.5 ,4.5 ,SWRH ,BLACK ,PLAIN ,A	BLACK	50
3	MLAA00	LABEL,APPROVAL	MLAA0062303	COMPLEX, (empty), , , ,	WITHOUT COLOR	
5	ACKA00	CAN ASSY,SHIELD	ACKA0023201	Main shield Can SUS 0.2T	SILVER	
6	MCBA00	CAN,SHIELD	MCBA0056001	PRESS, STS, 0.2, , ,	WITHOUT COLOR	36
6	MGAZ00	GASKET	MGAZ0076901	COMPLEX, (empty), , , ,	GOLD	56
6	MIDZ00	INSULATOR	MIDZ0237401	COMPLEX, (empty), , , ,	GREEN	59
5	ACKA01	CAN ASSY,SHIELD	ACKA0023301	Sub Shield Can SUS 0.3T	SILVER	
6	MAAA00	ABSORBER,ELECTROMAG NETIC WAVE	MAAA0003801	COMPLEX, (empty), , , ,	WITHOUT COLOR	60
6	MCBA00	CAN,SHIELD	MCBA0056101	PRESS, STS, 0.2, , ,	WITHOUT COLOR	38

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
5	MIDZ00	INSULATOR	MIDZ0231201	COMPLEX, (empty), , , ,	BLUE	57
5	MLAZ00	LABEL	MLAZ0038301	PID Label 4 Array	WITHOUT COLOR	

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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### 13.2 Replacement Parts <Main component>

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Color	Remark
1		GSM,BAR/FILP	TGSM0077201		SILVER	
4	SNGF00	ANTENNA,GSM,FIXED	SNGF0052302	3.0 , -5.0 dBd,, ,internal, GSM850/900/DCS/PCS ; , ,QUAD , -5.0 ,50 ,3.0		
4	SACY00	PCB ASSY,FLEXIBLE	SACY0100801	F_LCD		C
5	SACB00	PCB ASSY,FLEXIBLE,INSERT	SACB0058101			
5	SACE00	PCB ASSY,FLEXIBLE,SMT	SACE0091101			
6	SACC00	PCB ASSY,FLEXIBLE,SMT BOTTOM	SACC0066701			
7	C801	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
7	C802	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
7	C803	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
7	C804	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
7	C805	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
7	C806	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
7	C807	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
7	CN801	CONNECTOR,BOARD TO BOARD	ENBY0036101	44 PIN,0.4 mm,ETC , ,H=1.0, Plug		
7	CN802	CONNECTOR,BOARD TO BOARD	ENBY0034201	24 PIN,0.4 mm,ETC , ,GB042 H=1.0, Socket		
7	FB801	FILTER,BEAD,CHIP	SFBH0009601	220 ohm,1005 ,DCR : 0.35 , Rated current : 500mA,PBFREE		
7	L803	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
7	L804	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,		
7	Q801	TR,BJT,NPN	EQBN0020501	ESM ,0.15 W,R/TP , ; ,NPN ,5V ,60V ,50V ,150mA ,0.1uA MAX ,10 MIN 700 MAX ,100mW ,ESM ,R/TP ,3P		
7	R801	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
7	R802	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
7	VA801	VARISTOR	SEVY0005202	5.5 V,+-30 ,SMD ,1005, 100 pF, Pb free		
7	VA802	VARISTOR	SEVY0003901	5.5 V, ,SMD ,Vdc 5.5, Vb 8, Cp 420, 1.0*0.5*0.6 , ,5.5 ,480 ,1.0*0.5*0.6 ,[empty] ,SMD ,R/TP		
7	VA803	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		
7	VA804	VARISTOR	SEVY0005201	5.5 V, ,SMD ,1005, 50pF		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	SACD00	PCB ASSY,FLEXIBLE,SMT TOP	SACD0079301			
7	CN803	CONNECTOR,ETC	ENZY0020702	4 ,2.7 mm,ETC , ,Touch window contact		
7	LD801	DIODE,LED,7-SEG	EDLS0001102	7 ,3 DIGIT,R/TP ,R,G,B 1.6*1.6*0.4		
6	SPCY	PCB,FLEXIBLE	SPCY0191201	POLYI , 0.14mm,MULTI-2 , ; , , , , ,		
4	SJMY00	VIBRATOR,MOTOR	SJMY0008513			
4	SUSY00	SPEAKER	SUSY0028020	ASSY ,8 ohm,92 dB,1810 mm,3.0T 20mm ; , , , , ,WIRE		
4	SVCY00	CAMERA	SVCY0019701	CMOS ,MEGA ,3M FF Micron(1/4"),8.5x8.5x4.9, 90degree,FPCB		
4	SVLM00	LCD MODULE	SVLM0035201	Main ,3.0 inch ,240*400 ,43.08*75.4*1.8t ,262K ,TFT ,TM ,S6D14E0 , ,	B	
3	SAFY00	PCB ASSY,MAIN	SAFY0337501		COLOR UNFIXED	E
4	SAFB00	PCB ASSY,MAIN,INSERT	SAFB0102601		COLOR UNFIXED	
5	BRAH00	RESIN,PC	BRAH0001301	; , , ,[empty]	Black	
5	SACY00	PCB ASSY,FLEXIBLE	SACY0100901			F
6	SACB00	PCB ASSY,FLEXIBLE,INSERT	SACB0058201			
6	SACE00	PCB ASSY,FLEXIBLE,SMT	SACE0091301			
7	SACC00	PCB ASSY,FLEXIBLE,SMT BOTTOM	SACC0066801			
8	CN702	CONN,SOCKET	ENSY0023801	9 ,ETC , ,0.95 mm,13.3x13.65x1.65t, Detect Pin		
8	J701	CONN,SOCKET	ENSY0018101	6 PIN,ETC , ,2.54 mm,H=1.5		
7	SACD00	PCB ASSY,FLEXIBLE,SMT TOP	SACD0079401			
8	CN701	CONNECTOR,BOARD TO BOARD	ENBY0039501	20 PIN,0.4 mm,ETC , ,H=1.0, Plug		
7	SPCY	PCB,FLEXIBLE	SPCY0191301	POLYI , 0.14mm,MULTI-2 , ; , , , , ,		
4	SAFF00	PCB ASSY,MAIN,SMT	SAFF0249101		COLOR UNFIXED	
5	SAFC00	PCB ASSY,MAIN,SMT BOTTOM	SAFC0131701		COLOR UNFIXED	
6	ANT401	ANTENNA,MOBILE,FIXED	SNMF0051501	5 ,-5 dB,Internal, BT, Chip, Pb Free ; ,SINGLE , ,		
6	C104	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C105	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C108	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C109	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C114	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C115	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C120	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C122	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C125	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C130	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C2	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C3	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C309	CAP,CERAMIC,CHIP	ECCH0000147	2.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C311	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C321	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C336	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C337	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C338	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C343	CAP,CERAMIC,CHIP	ECCH0000147	2.2 nF,50V,K,X7R,HD,1005,R/TP		
6	C401	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C402	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C404	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C406	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C407	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C409	CAP,CHIP,MAKER	ECZH0003503	1 uF,25V ,K ,X5R ,HD ,1608 ,R/TP		
6	C410	DIODE,TVS	EDTY0011401	VMN2 ,5 V,10 W,R/TP ,. ,; ,7.82V ,. ,. ,100mW ,[empty] ,R/TP ,2P ,[empty]		
6	C411	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C415	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C416	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C422	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C424	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C425	DIODE,TVS	EDTY0011401	VMN2 ,5 V,10 W,R/TP ,. ,; ,7.82V ,. ,. ,100mW ,[empty] ,R/TP ,2P ,[empty]		
6	C431	CAP,CERAMIC,CHIP	ECCH0005603	2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP		
6	C434	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C435	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C436	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C437	CAP,CHIP,MAKER	ECZH0001217	470 nF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C438	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C439	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C440	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C441	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C445	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C448	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C449	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C498	CAP,CERAMIC,CHIP	ECCH0000195	3.9 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C501	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C507	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C510	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C512	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C514	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C515	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C516	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C517	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C518	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C519	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C520	VARISTOR	SEVY0004001	18 V, ,SMD ,3pF, 1005		
6	C521	VARISTOR	SEVY0004001	18 V, ,SMD ,3pF, 1005		
6	C601	CAP,TANTAL,CHIP	ECTH0004804	33 uF,10V ,M ,L_ESR ,3216 ,R/TP		
6	C603	CAP,CHIP,MAKER	ECZH0000802	1 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C604	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C605	CAP,CERAMIC,CHIP	ECCH0000151	4.7 nF,25V,K,X7R,HD,1005,R/TP		
6	C607	CAP,CHIP,MAKER	ECZH0001216	220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C608	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C609	CAP,CERAMIC,CHIP	ECCH0000901	2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C611	CAP,CERAMIC,CHIP	ECCH0000195	3.9 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C612	CAP,CERAMIC,CHIP	ECCH0000195	3.9 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C613	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C614	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C615	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C616	CAP,CHIP,MAKER	ECZH0000827	2.4 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C617	CAP,CHIP,MAKER	ECZH0000827	2.4 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C618	CAP,CERAMIC,CHIP	ECCH0000104	3 pF,50V,C,NP0,TC,1005,R/TP		
6	C619	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C620	CAP,CHIP,MAKER	ECZH0000822	1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C621	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C622	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C623	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C624	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C627	CAP,CERAMIC,CHIP	ECCH0002002	47000 pF,10V ,K ,B ,HD ,1005 ,R/TP		
6	C628	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C629	CAP,CERAMIC,CHIP	ECCH0000901	2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C630	CAP,CHIP,MAKER	ECZH0000806	5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C631	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C632	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C633	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C634	CAP,CERAMIC,CHIP	ECCH0000104	3 pF,50V,C,NP0,TC,1005,R/TP		
6	C635	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C636	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C637	INDUCTOR,CHIP	ELCH0003835	4.7 nH,S ,1005 ,R/TP ,MLCI		
6	C638	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C639	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C640	CAP,CHIP,MAKER	ECZH0000813	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C643	INDUCTOR,CHIP	ELCH0005001	2.2 nH,S ,1005 ,R/TP ,		
6	C646	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C648	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C649	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C650	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C651	CAP,CHIP,MAKER	ECZH0000802	1 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C697	CAP,CHIP,MAKER	ECZH0001002	0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	CN401	CONNECTOR,I/O	ENRY0009601	5 ,0.4 mm,ANGLE , ,Mold with SUS ; ; ,0.40MM ,ANGLE ,RECEPTACLE ,DIP ,[empty] ,		
6	CN402	CONNECTOR,ETC	ENZY0026901	3 ,2.5 mm,ETC , - , -		
6	CN501	CONNECTOR,BOARD TO BOARD	ENBY0039601	20 PIN,0.4 mm,ETC , ,H=1.0, Socket		
6	CN503	CONNECTOR,BOARD TO BOARD	ENBY0036001	40 PIN,0.4 mm,ETC , ,H=1.0, Socket		
6	D401	DIODE,TVS	EDTY0009801	SOT-963 ,5 V,25 W,R/TP , ; ; ; ; ,,[empty] ,[empty] ,2P ,1		
6	D503	DIODE,SWITCHING	EDSY0019301	SOD-523 ,30 V,0.2 A,R/TP , ; ; ,0.5V MAX ,30V ,0.2A ,2A ,5nS ,150mW ,SOD523 ,P/TP ,2P ,[empty]		
6	FB404	FILTER,BEAD,CHIP	SFBH0000912	1000 ohm,1005 ,		
6	FL401	FILTER,EMI/POWER	SFEY0007101	SMD ,1CH,1608Feedthru ESD/EMI filter for power Pb-free		
6	FL402	FILTER,CERAMIC	SFCY0000901	2450 MHz,2.00*1.25*0.95 ,SMD ,Bluetooth Band Pass Filter		
6	FL501	FILTER,EMI/POWER	SFEY0013201	SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 100ohm		
6	FL502	FILTER,EMI/POWER	SFEY0013201	SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 100ohm		
6	FL506	FILTER,EMI/POWER	SFEY0013201	SMD ,1608 ,EMI-ESD Filter, 4ch, 14V, 15pF, 100ohm		
6	FL601	FILTER,SEPERATOR	SFAY0011101	850.900 ,1800.1900 ,3.8 dB,4.1 dB, dB, dB,4532 ,4.5X3.2 Size Quad Band FEM		
6	L401	INDUCTOR,CHIP	ELCH0001444	100 nH,J ,1005 ,R/TP ,chip coil		
6	L402	INDUCTOR,CHIP	ELCH0001444	100 nH,J ,1005 ,R/TP ,chip coil		
6	L403	NOT ASSEMBLE	9999999999	NOT ASSEMBLE	Color Unfixed	
6	L497	INDUCTOR,CHIP	ELCH0001404	1.5 nH,S,1005,R/TP		
6	L499	INDUCTOR,CHIP	ELCH0005010	1.8 nH,S ,1005 ,R/TP ,		
6	L601	INDUCTOR,CHIP	ELCH0009110	5.1 nH,J ,1005 ,R/TP ,chip coil		
6	L602	INDUCTOR,CHIP	ELCH0017901	4.7 nH,J ,1005 ,R/TP ,		
6	L603	INDUCTOR,CHIP	ELCH0017801	18 nH,J ,1005 ,R/TP ,		
6	L605	INDUCTOR,CHIP	ELCH0001420	3.9 nH,S ,1005 ,R/TP ,PBFREE		
6	L606	INDUCTOR,CHIP	ELCH0012510	15 nH,G ,1005 ,R/TP ,chip coil		
6	L608	INDUCTOR,CHIP	ELCH0004727	100 nH,J ,1005 ,R/TP ,		
6	L609	INDUCTOR,CHIP	ELCH0003847	1.8 nH,S ,1005 ,R/TP ,chip coil		
6	M501	MODULE,ETC	SMZY0023501	3.8 Backup Capacitor 0.03F , ; ,Module Assembly		
6	Q1	TR,BJT,NPN	EQBN0020501	ESM ,0.15 W,R/TP , ; ; ,NPN ,5V ,60V ,50V ,150mA ,0.1uA MAX ,10 MIN 700 MAX ,100mW ,ESM ,R/TP ,3P		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	Q202	TR,BJT,NPN	EQBN0020501	ESM ,0.15 W,R/TP , ; ,NPN ,5V ,60V ,50V ,150mA ,0.1uA MAX ,10 MIN 700 MAX ,100mW ,ESM ,R/TP ,3P		
6	R1	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R107	RES,CHIP,MAKER	ERHZ0000434	1 ohm,1/16W ,J ,1005 ,R/TP		
6	R2	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R3	RES,CHIP,MAKER	ERHZ0000437	2 Kohm,1/16W ,J ,1005 ,R/TP		
6	R301	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R304	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R311	RES,CHIP,MAKER	ERHZ0000414	120 Kohm,1/16W ,J ,1005 ,R/TP		
6	R312	RES,CHIP,MAKER	ERHZ0000414	120 Kohm,1/16W ,J ,1005 ,R/TP		
6	R314	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R404	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R405	RES,CHIP	ERHY0000185	820 ohm,1/16W ,F ,1005 ,R/TP		
6	R406	RES,CHIP,MAKER	ERHZ0000286	4700 ohm,1/16W ,F ,1005 ,R/TP		
6	R407	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R408	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R410	RES,CHIP	ERHY0000283	130K ohm,1/16W,J,1005,R/TP		
6	R411	RES,CHIP	ERHY0000283	130K ohm,1/16W,J,1005,R/TP		
6	R417	RES,CHIP	ERHY0003201	1000 ohm,1/16W ,F ,1005 ,R/TP		
6	R421	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R502	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		
6	R503	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R504	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R505	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R506	RES,CHIP,MAKER	ERHZ0000486	47 Kohm,1/16W ,J ,1005 ,R/TP		
6	R508	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R509	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R511	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R601	RES,CHIP,MAKER	ERHZ0000206	10 ohm,1/16W ,F ,1005 ,R/TP		
6	R602	THERMISTOR	SETY0006301	NTC ,10000 ohm,SMD ,1005 ,3350~3399k, J, R/T, PBFREE		
6	R603	RES,CHIP	ERHY0000185	820 ohm,1/16W ,F ,1005 ,R/TP		
6	R604	RES,CHIP,MAKER	ERHZ0000244	22 Kohm,1/16W ,F ,1005 ,R/TP		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	R605	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R606	RES,CHIP,MAKER	ERHZ0000434	1 ohm,1/16W ,J ,1005 ,R/TP		
6	R607	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R609	RES,CHIP,MAKER	ERHZ0000434	1 ohm,1/16W ,J ,1005 ,R/TP		
6	RA501	RES,ARRAY,R	ERNR0000404	100 Kohm,100 Kohm,8 PIN,J ,1/16W ,SMD ,R/TP		
6	SW601	CONN,RF SWITCH	ENWY0006301	,SMD ,0.8 dB, ; ,0.40MM ,STRAIGHT ,SOCKET ,SMD ,[empty] ,[empty] , ,		
6	U301	IC	EUSY0140904	SSOP5-P-0.65 ,5 ,R/TP ,XOR GATE ,; ,IC,TTL		
6	U302	IC	EUSY0353901	PLP1010-4 ,4 PIN,R/TP ,1x1 LDO, 3.0V , 150mA ,; ,IC,LDO Voltage Regulator		
6	U303	IC	EUSY0349001	BGA ,8 PIN,R/TP ,Class AB SPK AMP ,; ,IC,Audio Amplifier		
6	U306	IC	EUSY0140904	SSOP5-P-0.65 ,5 ,R/TP ,XOR GATE ,; ,IC,TTL		
6	U401	IC	EUSY0394501	WLCSP ,39 ,R/TP ,3.2x3.6x0.6, BT2.1+FM Rx/Tx, 90n ,; ,IC,Bluetooth		
6	U402	IC	EUSY0388501	DFN ,10 ,R/TP ,Cal Test Mode Single Charger IC for Micro USB ,; ,IC,Charger		
6	U502	IC	EUSY0336502	, PIN,R/TP ,; ,IC,Charge Pump		
6	U601	PAM	SMPY0021101	dBm, %, A, dBc, dB,5x5 ,SMD ,Linear EDGE PAM. 5005's Halogen Free ver. ; , , , , ,LGA ,R/TP ,		
6	U602	IC	EUSY0274801	VQFN ,40 PIN,R/TP ,GPRS, EDGE TRANSCEIVER		
6	VA501	VARISTOR	SEVY0008302	5.5 V,30% ,SMD ,1409Size (4CH)		
6	X601	X-TAL	EXXY0025701	26 MHz,10 PPM,8 pF,40 ohm,SMD ,32X25X0.6 ,X-Tal (Infinion chip), Pb-Free ; , ,10PPM , , ,SMD ,R/TP		
5	SAFD00	PCB ASSY,MAIN,SMT TOP	SAFD0128901		COLOR UNFIXED	
6	C1	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C101	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C102	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C103	CAP,CHIP,MAKER	ECZH0001216	220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C106	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C107	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C110	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C111	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C112	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C113	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C116	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C117	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C118	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C119	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C121	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C123	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C124	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C126	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C127	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C128	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C129	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C131	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C132	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C133	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C201	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C202	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C203	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C204	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C205	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C206	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C207	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C208	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C209	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C210	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C211	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C213	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C214	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C215	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C216	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C217	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C218	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C219	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C220	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C221	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C222	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C223	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C225	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C226	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C227	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C228	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C229	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C231	CAP,CERAMIC,CHIP	ECCH0005604	10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm		
6	C301	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C302	CAP,CERAMIC,CHIP	ECCH0005604	10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm		
6	C303	CAP,CERAMIC,CHIP	ECCH0005604	10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm		
6	C304	CAP,CERAMIC,CHIP	ECCH0005604	10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm		
6	C305	CAP,CERAMIC,CHIP	ECCH0005603	2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP		
6	C306	CAP,CERAMIC,CHIP	ECCH0005604	10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm		
6	C307	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C308	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C310	CAP,CERAMIC,CHIP	ECCH0005603	2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP		
6	C312	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C313	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C314	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C315	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C316	CAP,CERAMIC,CHIP	ECCH0005603	2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP		
6	C317	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C318	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C319	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C320	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C322	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C323	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C324	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C325	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C326	CAP,CERAMIC,CHIP	ECCH0005604	10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm		
6	C327	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C328	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C329	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C330	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C331	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C332	CAP,CERAMIC,CHIP	ECCH0005603	2.2 uF,10V ,K ,X5R ,TC ,1608 ,R/TP		
6	C333	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C334	CAP,CERAMIC,CHIP	ECCH0000198	2.2 uF,6.3V ,M ,X5R ,TC ,1005 ,R/TP		
6	C335	CAP,CERAMIC,CHIP	ECCH0017501	22 uF,6.3V ,M ,X5R ,HD ,1608 ,R/TP ; , ,20% ,6.3V ,X5R ,-55TO+85C ,1608 ,R/TP , mm		
6	C339	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C340	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C341	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C342	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C413	CAP,CHIP,MAKER	ECZH0001108	6.8 nF,25V ,K ,X7R ,HD ,1005 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,[empty] ,[empty]		
6	C417	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C418	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C419	CAP,CERAMIC,CHIP	ECCH0000129	120 pF,50V,J,NP0,TC,1005,R/TP		
6	C420	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C421	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C423	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C426	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C427	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C428	CAP,CERAMIC,CHIP	ECCH0000179	22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP		
6	C429	CAP,CERAMIC,CHIP	ECCH0005604	10000000 pF,6.3V ,M ,X5R ,TC ,1608 ,R/TP , , ,[empty] ,[empty] ,[empty] ,[empty] ,0.8 mm		
6	C430	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C502	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C503	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	C504	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	C505	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C506	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C509	CAP,CHIP,MAKER	ECZH0001215	1 uF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C511	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C513	CAP,CHIP,MAKER	ECZH0003103	0.1 uF,10V ,K ,X7R ,HD ,1005 ,R/TP		
6	CN502	CONNECTOR,BOARD TO BOARD	ENBY0036201	44 PIN,0.4 mm,ETC , ,H=1.0, Socket		
6	D301	DIODE,SWITCHING	EDSY0019201	ESC ,85 V,0.3 A,R/TP , ; , ,85 ,300mA , ,4.0nS MAX ,150mW ,ESC ,R/TP ,2P ,[empty]		
6	D302	DIODE,SWITCHING	EDSY0019201	ESC ,85 V,0.3 A,R/TP , ; , ,85 ,300mA , ,4.0nS MAX ,150mW ,ESC ,R/TP ,2P ,[empty]		
6	D501	DIODE,TVS	EDTY0009801	SOT-963 ,5 V,25 W,R/TP , ; , , ,,[empty] ,[empty] ,2P ,1		
6	D502	DIODE,TVS	EDTY0009801	SOT-963 ,5 V,25 W,R/TP , ; , , , ,,[empty] ,[empty] ,2P ,1		
6	FB201	FILTER,BEAD,CHIP	SFBH0009201	220 ohm,1608 ,		
6	FB301	FILTER,BEAD,CHIP	SFBH0009601	220 ohm,1005 ,DCR : 0.35 , Rated current : 500mA,PBFREE		
6	FB302	FILTER,BEAD,CHIP	SFBH0009601	220 ohm,1005 ,DCR : 0.35 , Rated current : 500mA,PBFREE		
6	FB401	FILTER,BEAD,CHIP	SFBH0008105	1800 ohm,1005 ,Chip bead ; ,1800ohm ; ,[empty] ,R/TP		
6	FB402	FILTER,BEAD,CHIP	SFBH0000912	1000 ohm,1005 ,		
6	FB403	FILTER,BEAD,CHIP	SFBH0000912	1000 ohm,1005 ,		
6	FL503	FILTER,EMI/POWER	SFEY0015501	SMD ,Pb-free_4ch_5p-100ohm-5p ; ,Filter,LCR		
6	FL504	FILTER,EMI/POWER	SFEY0015501	SMD ,Pb-free_4ch_5p-100ohm-5p ; ,Filter,LCR		
6	FL505	FILTER,EMI/POWER	SFEY0015501	SMD ,Pb-free_4ch_5p-100ohm-5p ; ,Filter,LCR		
6	L201	INDUCTOR,CHIP	ELCH0004727	100 nH,J ,1005 ,R/TP ,		
6	L202	INDUCTOR,CHIP	ELCH0004727	100 nH,J ,1005 ,R/TP ,		
6	L203	INDUCTOR,CHIP	ELCH0004727	100 nH,J ,1005 ,R/TP ,		
6	L301	INDUCTOR,SMD,POWER	ELCP0006703	10 uH,M ,3.2*2.6*1.0 ,R/TP ,		
6	L302	INDUCTOR,SMD,POWER	ELCP0006703	10 uH,M ,3.2*2.6*1.0 ,R/TP ,		
6	MIC201	MICROPHONE	SUMY0010609	UNIT ,-42 dB,3.76*2.95*1.1 ,mems smd mic ; , , ,OMNI ,[empty] , ,[empty]		
6	R101	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R102	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	R103	RES,CHIP,MAKER	ERHZ0000244	22 Kohm,1/16W ,F ,1005 ,R/TP		
6	R104	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R105	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R109	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R110	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R111	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R112	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		
6	R113	RES,CHIP	ERHY0000166	390 Kohm,1/16W ,F ,1005 ,R/TP		
6	R114	RES,CHIP,MAKER	ERHZ0000519	9100 ohm,1/16W ,J ,1005 ,R/TP		
6	R115	RES,CHIP,MAKER	ERHZ0000204	100 Kohm,1/16W ,F ,1005 ,R/TP		
6	R202	RES,CHIP,MAKER	ERHZ0000534	8.2 ohm,1/16W ,J ,1005 ,R/TP		
6	R203	RES,CHIP,MAKER	ERHZ0000534	8.2 ohm,1/16W ,J ,1005 ,R/TP		
6	R204	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R205	RES,CHIP,MAKER	ERHZ0000267	3300 ohm,1/16W ,F ,1005 ,R/TP		
6	R206	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R303	RES,CHIP,MAKER	ERHZ0000454	27 Kohm,1/16W ,J ,1005 ,R/TP		
6	R305	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R307	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R308	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R309	RES,CHIP,MAKER	ERHZ0000474	390 ohm,1/16W ,J ,1005 ,R/TP		
6	R310	RES,CHIP,MAKER	ERHZ0000204	100 Kohm,1/16W ,F ,1005 ,R/TP		
6	R313	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R4	RES,CHIP,MAKER	ERHZ0000467	330 Kohm,1/16W ,J ,1005 ,R/TP		
6	R402	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		
6	R412	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R413	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R415	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R418	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R5	RES,CHIP,MAKER	ERHZ0000451	27 ohm,1/16W ,J ,1005 ,R/TP		
6	R501	RES,CHIP,MAKER	ERHZ0000203	10 Kohm,1/16W ,F ,1005 ,R/TP		
6	R507	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R6	RES,CHIP,MAKER	ERHZ0000451	27 ohm,1/16W ,J ,1005 ,R/TP		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Spec	Color	Remark
6	SPFY	PCB,MAIN	SPFY0206001	FR-4 ,0.8 mm,LX-BUMP 10 , ; , , , , , ,		
6	U101	IC	EUSY0322801	BGA ,10 ,R/TP ,Multimedia Extension EDGE BB, 313 Ball , ,IC,Digital Baseband Processor		
6	U200	IC	EUSY0371201	WLP ,20 ,R/TP ,MUIC for 5Pin Micro USB , ; ,IC,Analog Switch		
6	U201	IC	EUSY0388101	FBGA ,149 ,ETC ,FULLY 1.8V 2G(LB/128Mx16) NAND+1G(DDR/16Mx4x16) SDRAM , ; ,IC,MCP		
6	U202	IC	EUSY0360201	CSP ,20 ,R/TP ,Class D(mono) + Capless HP + A/S , ; ,IC,Audio Sub System		
6	U203	IC	EUSY0102803	MicroPak ,5 ,R/TP ,Dual AND gate , ; ,IC,TTL		
6	U304	IC	EUSY0345201	3*3 QFN ,10 PIN,R/TP ,3xis Accelerometer , ; ,IC,A/D Converter		
6	U305	IC	EUSY0323901	BGA PG-WFSGA ,121 PIN,R/TP ,SMPOWER3		
6	U403	IC	EUSY0337101	CSP ,12 PIN,R/TP ,Touchscreen Controller IC , ; ,IC,A/D Converter		
6	U501	IC	EUSY0355501	PLP1010-4 ,4 PIN,R/TP ,1.8V 150mA Single LDO , ; ,IC,LDO Voltage Regulator		
6	VA201	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA401	VARISTOR	SEVY0008302	5.5 V,30% ,SMD ,1409Size (4CH)		
6	VA502	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	X101	X-TAL	EXXY0018701	32.768 KHz,20 PPM,12.5 pF,70 Kohm,SMD ,3.2*1.5*0.9 ,		

## 13. EXPLODED VIEW & REPLACEMENT PART LIST

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### 13.3 Accessory

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Color	Remark
3	SBPL00	BATTERY PACK,LI-ION	SBPL0100001	3.7 V,900 mAh,1 CELL,PRISMATIC ,533640,Innerpack,WW ; ,3.7 ,900 ,180 ,PRISMATIC ,5.3xx36x40 ,5.7x41x39 ,BLACK ,innerpack ,		
3	SGDY00	DATA CABLE	SGDY0016701	;,[empty] ,[empty] ,[empty] ,microUSB[5Pin], USB plug A Type ,BLACK , ,[empty]		
3	SGEY00	EAR PHONE/EAR MIKE SET	SGEY0003741	; ,RMS 20mW(0.56V,RMS) ,16Ohm+-2.4Ohm 1KHZ ,116dB+-3dB 1KHZ,3mW ,116dB 1KHZ ,96dB 100HZ ,[empty] ,BLACK ,5P MICRO USB CONNECTOR ,MICRO USB 5P ,Earphone,Stereo		
3	SSAD00	ADAPTOR,AC-DC	SSAD0035901	100-240V ,5060 Hz,5.1 V,700 mA,CE ,AC-DC ADAPTOR ; ,90Vac~264Vac ,4.75Vdc~5.25Vdc ,700mA ,5060 ,WALL 2P ,USB ,		
5	MHBY00	HANDSTRAP	MHBY0009201	CASTING, Zn Alloy, , , ,	TITAN GRAY	12